Sun Storage 7000 Unified Storage System Installation Guide

Part No: 821–1386–10 Rev.A
February 2010

Copyright ©2010 Sun Microsystems, Inc. All rights reserved. 4150 Network Circle, Santa Clara, CA 95054 U.S.A.

Sun Microsystems, Inc. has intellectual property rights relating to technology embodied in the product that is described in this document. In particular, and without limitation, these intellectual property rights may include one or more U.S. patents or pending patent applications in the U.S. and in other countries.

U.S. Government Rights – Commercial software. Government users are subject to the Sun Microsystems, Inc. standard license agreement and applicable provisions of the FAR and its supplements.

This distribution may include materials developed by third parties.

Parts of the product may be derived from Berkeley BSD systems, licensed from the University of California. UNIX is a registered trademark in the U.S. and other countries, exclusively licensed through X/Open Company, Ltd.

Sun, Sun Microsystems, the Sun logo, the Solaris logo, the Java Coffee Cup logo, docs.sun.com, ZFS, Java, and Solaris are trademarks or registered trademarks of Sun Microsystems, Inc. or its subsidiaries in the U.S. and other countries. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. in the U.S. and other countries. Products bearing SPARC trademarks are based upon an architecture developed by Sun Microsystems, Inc.

The OPEN LOOK and Sun™ Graphical User Interface was developed by Sun Microsystems, Inc. for its users and licensees. Sun acknowledges the pioneering efforts of Xerox in researching and developing the concept of visual or graphical user interfaces for the computer industry. Sun holds a non-exclusive license from Xerox to the Xerox Graphical User Interface, which license also covers Sun's licensees who implement OPEN LOOK GUIs and otherwise comply with Sun's written license agreements.

Products covered by and information contained in this publication are controlled by U.S. Export Control laws and may be subject to the export or import laws in other countries. Nuclear, missile, chemical or biological weapons or nuclear maritime end uses or end users, whether direct or indirect, are strictly prohibited. Export or reexport to countries subject to U.S. embargo or to entities identified on U.S. export exclusion lists, including, but not limited to, the denied persons and specially designated nationals lists is strictly prohibited.

DOCUMENTATION IS PROVIDED “AS IS” AND ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS AND WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT, ARE DISCLAIMED, EXCEPT TO THE EXTENT THAT SUCH DISCLAIMERS ARE HELD TO BE LEGALLY INVALID.

Copyright ©2010 Sun Microsystems, Inc. Tous droits réservés. 4150 Network Circle, Santa Clara, CA 95054 U.S.A.

Sun Microsystems, Inc. détient les droits de propriété intellectuelle relatifs à la technologie incorporée dans le produit qui est décrit dans ce document. En particulier, et ce sans limitation, ces droits de propriété intellectuelle peuvent inclure un ou plusieurs brevets américains ou des applications de brevet en attente aux Etats-Unis et dans d'autres pays.

Cette distribution peut comprendre des composants développés par des tierces personnes.

Certaines composants de ce produit peuvent être dérivées du logiciel Berkeley BSD, licenciés par l'Université de Californie. UNIX est une marque déposée aux Etats-Unis et dans d'autres pays; elle est licenciée exclusivement par X/Open Company, Ltd.

Sun, Sun Microsystems, le logo Sun, le logo Solaris, le logo Java Coffee Cup, docs.sun.com, ZFS, Java et Solaris sont des marques de fabrique ou des marques déposées de Sun Microsystems, Inc., ou ses filiales, aux Etats-Unis et dans d'autres pays. Toutes les marques SPARC sont utilisées sous licence et sont des marques de fabrique ou des marques déposées de SPARC International, Inc. aux Etats-Unis et dans d'autres pays. Les produits portant les marques SPARC sont basés sur une architecture développée par Sun Microsystems, Inc.

L'interface d'utilisation graphique OPEN LOOK et Sun a été développée par Sun Microsystems, Inc. pour ses utilisateurs et licenciés. Sun reconnaît les efforts de pionniers de Xerox pour la recherche et le développement du concept des interfaces d'utilisation visuelle ou graphique pour l'industrie de l'informatique. Sun détient une licence non exclusive de Xerox sur l'interface d'utilisation graphique Xerox, cette licence couvrant également les licenciés de Sun qui mettent en place l'interface d'utilisation graphique OPEN LOOK et qui, en outre, se conforment aux licences écrites de Sun.

Les produits qui font l'objet de cette publication et les informations qu'il contient sont régis par la legislation américaine en matière de contrôle des exportations et peuvent être soumis au droit d'autres pays dans le domaine des exportations et importations. Les utilisations finales, ou utilisateurs finaux, pour des armes nucléaires, des missiles, des armes chimiques ou biologiques ou pour le nucléaire maritime, directement ou indirectement, sont strictement interdites. Les exportations ou réexportations vers des pays sous embargo des Etats-Unis, ou vers des entités figurant sur les listes d'exclusion d'exportation américaines, y compris, mais de manière non exclusive, la liste de personnes qui font objet d'un ordre de ne pas participer, d'une façon directe ou indirecte, aux exportations des produits ou des services qui sont régis par la legislation américaine en matière de contrôle des exportations et la liste de ressortissants spécifiquement designés, sont rigoureusement interdites.

LA DOCUMENTATION EST FOURNIE "EN L'ETAT" ET TOUTES AUTRES CONDITIONS, DECLARATIONS ET GARANTIES EXPRESSES OU TACITES SONT FORMELLEMENT EXCLUES, DANS LA MESURE AUTORISEE PAR LA LOI APPLICABLE, Y COMPRIS NOTAMMENT TOUTE GARANTIE IMPLICITE RELATIVE A LA QUALITE MARCHANDE, A L'APTITUDE A UNE UTILISATION PARTICULIERE OU A L'ABSENCE DE CONTREFACON.

100412@23626

Contents

Preface 5

1 **Introduction** 9
Overview 9
Introduction 9

2 **Installation** 13
Installation 13
Introduction 13
Controller 13
Controller Installation Overview 13
Prerequisites 14
Tasks 15
Shelf 28
Disk Shelf Installation 28
Prerequisites 29
Tasks 30
Cabling 37
Cabling Diagrams 37
7210 Cabling 38
Connecting Expansion Storage to the Sun Storage 7210 38
7310 Cabling 40
Connecting Expansion Storage to the Sun Storage 7310 40
7310 Cluster Cabling 43
Connecting Expansion Storage to the Sun Storage 7310 Cluster 43
7410 Cabling pt.1 46
Connecting Expansion Storage to the Sun Storage 7410 46

7410 Cabling pt.2 49
Connecting Expansion Storage to the Sun Storage 7410 (cont.) 49
7410 Cluster Cabling pt.1 53
Connecting expansion storage to the Sun Storage 7410 Cluster 53
7410 Cluster Cabling pt.2 58
Connecting Expansion Storage to the Sun Storage 7410 Cluster (cont.) 58
Power 63
Powering On and Configuring the Appliance 63
Tasks 64
Next Steps 65
Initial 66
Initial Configuration 66
Prerequisites 66
Summary 66
BUI 67
CLI 67

Glossary 73

Index 75

Preface

The *Sun Storage 7000 Unified Storage System Installation Guide* contains installation, cabling and initial configuration documentation for the Sun Storage 7000 Unified Storage System series of NAS appliances.

This documentation is also available while using the appliance Browser User Interface, accessible via the Help button. The appliance documentation may be updated using the System Upgrade procedure documented in the System Service Manual.

Who Should Use This Book

These notes are for users and system administrators who install and use the Sun Storage 7000 server appliances.

Related Documentation

Refer to the following documentation for installation instructions, hardware overviews, service procedures and software update notes.

- Administration Guide and Service Manual (`http://wikis.sun.com/display/fishworks/documentation/`)
- Release Notes (`http://wikis.sun.com/display/fishworks/software+updates`)

Third-Party Web Site References

Third-party URLs are referenced in this document and provide additional, related information.

Note – Sun is not responsible for the availability of third-party Web sites mentioned in this document. Sun does not endorse and is not responsible or liable for any content, advertising, products, or other materials that are available on or through such sites or resources. Sun will not be responsible or liable for any actual or alleged damage or loss caused by or in connection with the use of or reliance on any such content, goods, or services that are available on or through such sites or resources.

Documentation, Support, and Training

The Sun web site provides information about the following additional resources:

- Documentation (`http://www.sun.com/documentation/`)
- Support (`http://www.sun.com/support/`)
- Training (`http://www.sun.com/training/`)

Typographic Conventions

The following table describes the typographic conventions that are used in this book.

TABLE P–1 Typographic Conventions

Typeface	Meaning	Example
`AaBbCc123`	The names of commands, files, and directories, and onscreen computer output	Use the `help` command to show available actions. `Last login: Mon Oct 13 15:43:05 2008 from kiowa`
`AaBbCc123`	What you type, contrasted with onscreen computer output	`caji console login: root` `Password:`
aabbcc123	Placeholder: replace with a real name or value	To view an individual property, use `get` *propertyname*.
AaBbCc123	Book titles, new terms, and terms to be emphasized	Read Chapter 6 in the *User's Guide*. A *cache* is a copy that is stored locally. Do *not* save the file. **Note:** Some emphasized items appear bold online.

CLI Prompts in Command Examples

The following table shows the default Command Line Interface prompts for the appliance.

TABLE P–2 CLI Prompts

Type	Prompt
Appliance CLI	`machine_name:>`

◆ ◆ ◆ CHAPTER 1

1 Introduction

Overview

Introduction

The Sun Storage 7000 Unified Storage family of products provide efficient file and block data services to clients over a network, and a rich set of data services that can be applied to the data stored on the system.

Platforms

- Sun Storage 7110
- Sun Storage 7210
- Sun Storage 7310
- Sun Storage 7410
- Sun Disk Shelf J4400/J4410/J4500

Protocols

The Unified Storage products include support for a variety of industry-standard client protocols, including:

- CIFS
- NFS
- HTTP and HTTPS

- WebDAV
- iSCSI
- FC
- FTP
- SFTP

Key Features

Your Sun Storage system also includes new technologies to deliver the best storage price/performance and unprecedented observability of your workloads in production, including:

- Analytics, a system for dynamically observing the behavior of your system in real-time and viewing data graphically
- The ZFS Hybrid Storage Pool, composed of optional Flash-memory devices for acceleration of reads and writes, low-power, high-capacity disks, and DRAM memory, all managed transparently as a single data hierarchy

Data Services

To manage the data that you export using these protocols, you can configure your Sun Storage system using the built-in collection of advanced data services, including:

- RAID-Z (RAID-5 and RAID-6), mirrored, and striped disk configurations
- Unlimited read-only and read-write snapshots, with snapshot schedules
- Data deduplication
- Built-in data compression
- Remote replication of data for disaster recovery
- Active-active clustering for high availability (7310 and 7410)
- Thin provisioning of iSCSI LUNs
- Virus scanning and quarantine
- NDMP backup and restore

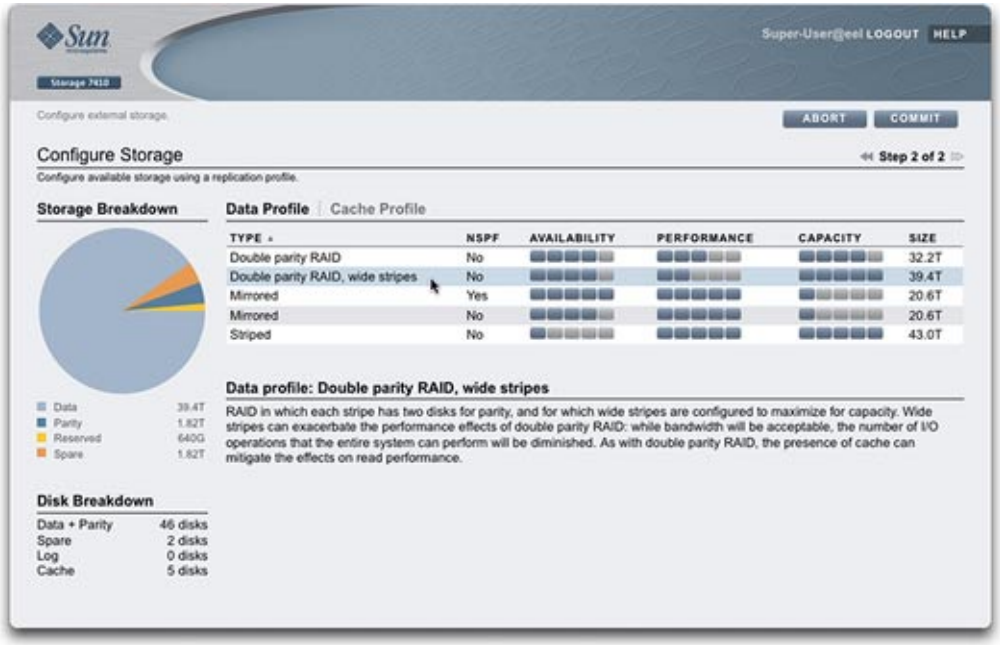
Availability

To maximize the availability of your data in production, the Sun Storage products include a complete end-to-end architecture for data integrity, including redundancies at every level of the stack. Key features include:

- Predictive Self-Healing and diagnosis of all system hardware failures: CPUs, DRAM, I/O cards, disks, fans, power supplies
- ZFS end-to-end data checksums of all data and metadata, protecting data throughout the stack
- RAID-6 (DP) and optional RAID-6 across disk shelves
- Active-active clustering for high availability (7310 and 7410)

- Link aggregations and IP multipathing for network failure protection
- I/O Multipathing between the controller and disk shelves
- Integrated software restart of all system software services
- Phone-Home of telemetry for all software and hardware Issues
- Lights-out Management of each system for remote power control and console access

Browser User Interface (BUI)



The browser user interface

The BUI is the graphical tool for administration of the appliance. The BUI provides an intuitive environment for administration tasks, visualizing concepts, and analyzing performance data.

The management software is designed to be fully featured and functional on the following supported web browsers: Firefox 2.x and 3.x, Internet Explorer 7 and 8, Safari 3.1 or later, and WebKit 525.13 or later.

Direct your browser to the system using either the *IP address* or *host name* you assigned to the NET0 port as follows: https://ipaddress:215 or https://hostname:215. The login screen appears.

Command Line Interface (CLI)

The CLI is designed to mirror the capabilities of the BUI, while also providing a powerful scripting environment for performing repetitive tasks. The following sections describe details of the CLI. When navigating through the CLI, there are two principles to be aware of:

- Tab completion is used extensively - if you are not sure what to type in any given context, pressing the Tab key will provide you with possible options. Throughout the documentation, pressing Tab is presented as the word "tab" in bold italics.
- Help is always available - the help command provides context-specific help. Help on a particular topic is available by specifying the topic as an argument to help, for example help commands. Available topics are displayed by tab-completing the help command, or by typing help topics.

You can combine these two principles, as follows:

```
dory:> help tab
builtins    commands    general     help        properties  script
```

◆ ◆ ◆ CHAPTER 2

Installation

Installation

Introduction

This section addresses how to physically install the system chassis into a rack, connect controllers in a cluster, and expand storage. The following topics are described.

- Controller Installation
- Disk Shelf Installation
- Cabling
- Power on and Configuration

Controller

Controller Installation Overview

This section describes how to install any Sun Storage Unified Storage 7000 controller model into a rack using the rail assembly in the bolt-on rackmount kit. Note that if your rack mount kit shipped with installation instructions, use those instructions instead.

Observe the following cautions:

- Always load equipment into a rack from the bottom up so that it will not become top-heavy and tip over. Deploy the anti-tip bar to the prevent the rack from tipping during equipment installation.
- Ensure that the temperature in the rack does not exceed the controller's maximum ambient rated temperatures. Consider the total airflow requirements of all equipment installed in the rack to ensure that the equipment is operated within its specified temperature range.
- For best results, only qualified Sun service personnel should perform cluster installation and configuration. Contact Sun Service for assistance.

Prerequisites

Refer to the poster that shipped with the product or the following hardware service sections located on http://wikis.sun.com/display/fishworks (`http://wikis.sun.com/display/fishworks`) for an overview of your system controller.

- 7110 Overview - view component diagrams and specifications
- 7210 Overview - view component diagrams and specifications
- 7310 Overview - view component diagrams, specifications, and cluster options
- 7410 Overview - view component diagrams, specifications, and cluster options

If you intend to install disk shelves into the same rack, refer to the Disk Shelf Installation section (applies to J4400 and J4500) for how to install them into the bottom of your rack.

Check that your rack is compatible with the slide rail and cable management assembly options as follows:

- The structure is a four-post rack with mounting at both front and back. Two-post racks are *not* compatible.
- The horizontal opening and unit vertical pitch conforms to ANSI/EIA 310-D-1992 or IEC 60927 standards.
- The distance between the front and back mounting planes is between 24 inches and 36 inches (610 mm to 915 mm).
- The distance to the front cabinet door, providing clearance depth in front of the front mounting plane, is at least 1 inch (25.4 mm).
- The distance to the back cabinet door, providing clearance depth behind the front mounting plane, is at least 31.5 inches (800 mm) with the cable management assembly, or 27.5 inches (700 mm) without the cable management assembly.
- The distance between structural supports and cable troughs, providing clearance width between the front and back mounting planes, is at least 18 inches (456 mm).

Tasks

The following are installation tasks with enumerated steps.

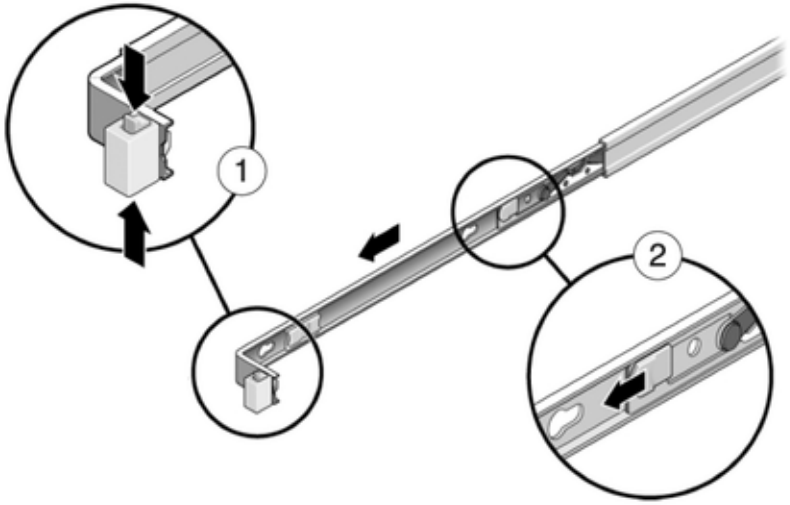
Controller Tasks

▼ Installing Mounting Brackets on the Chassis

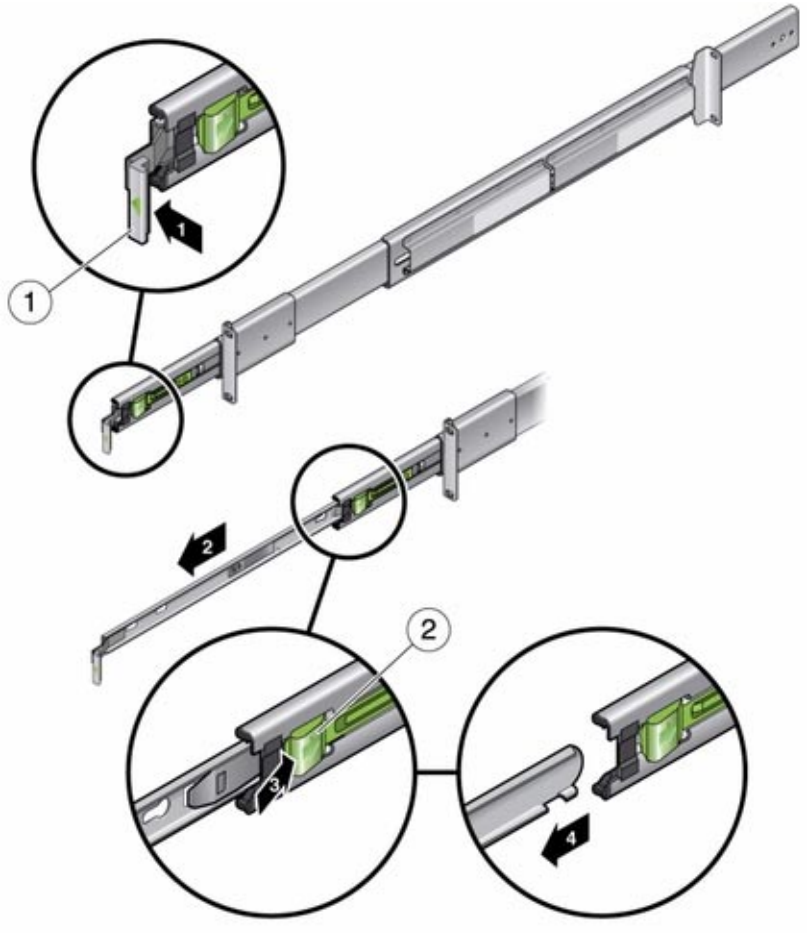
If the mounting brackets are shipped inside the slide rails, you must remove them before beginning this procedure, as follows.

- Unpack the slide rails and locate the slide rail lock at the front of the assembly.
- Squeeze and hold the tabs at top and bottom of the lock while you pull the mounting bracket out to the stop.
- Push the mounting bracket release button toward the front of the mounting bracket while withdrawing the bracket from the assembly.

The following graphic illustrates the 7110, 7310, and 7410 rail kit.

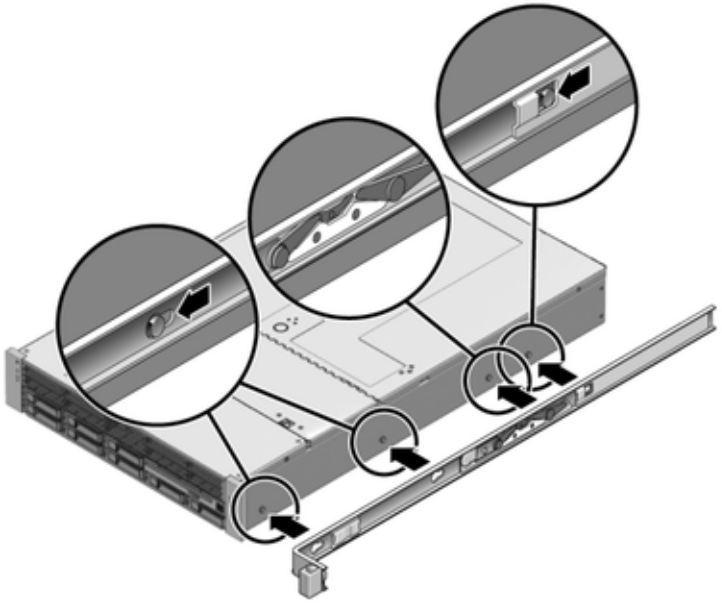


The following graphic illustrates the 7210 rail kit.

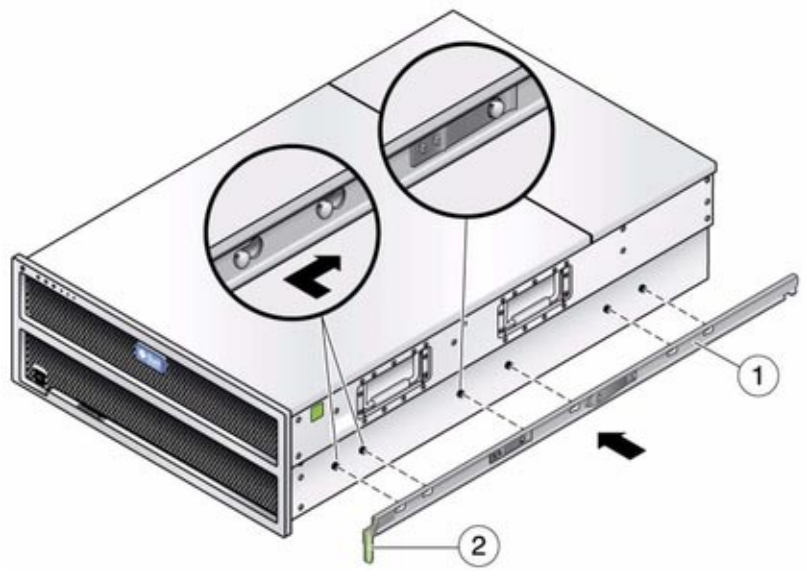


1 **Position a mounting bracket against the chassis so that the slide rail lock is at the front of the chassis, and the keyed openings on the mounting bracket are aligned with the locating pins on the side of the chassis.**

2 **The following graphic illustrates the 7110, 7310, and 7410 mounting brackets.**



The following graphic illustrates the 7210 mounting brackets.



3 **With the heads of the four chassis locating pins protruding though the four keyed openings in the mounting bracket, pull the mounting-bracket toward the front of the chassis until the mounting-bracket clip locks into place with an audible click.**

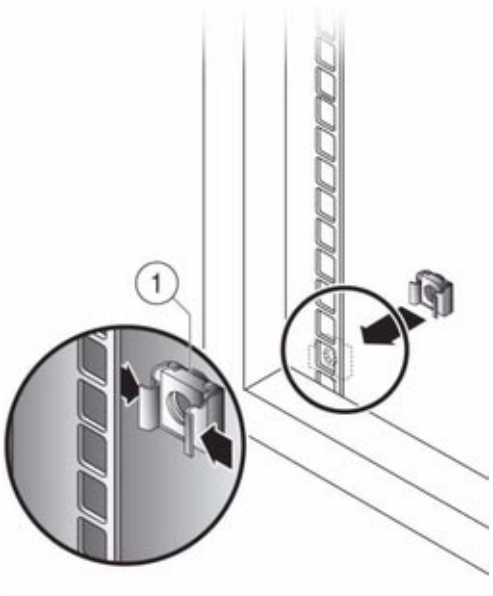
4 **Verify that all mounting pins are securely fastened to the chassis.**

5 **Repeat to install the remaining mounting bracket on the other side of the chassis.**

▼ Installing the Chassis into the Rack Slide Rails

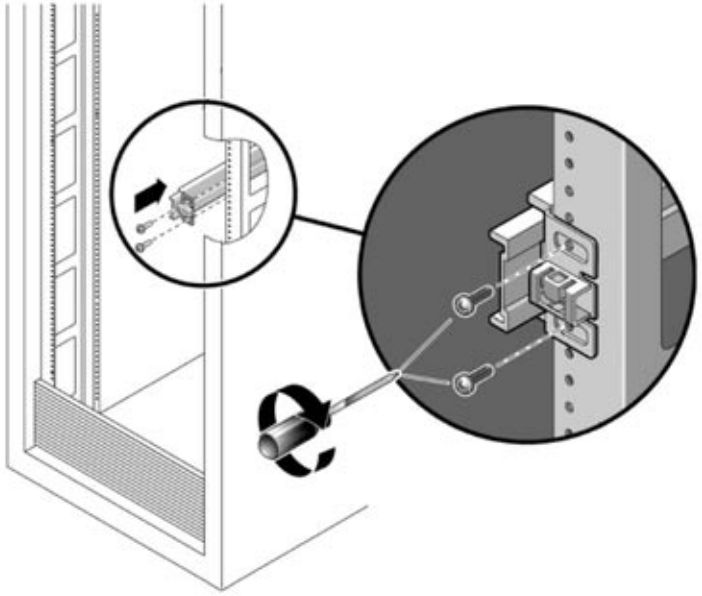
This procedure requires a minimum of two people because of the weight of the chassis. Attempting this procedure alone could result in equipment damage or personal injury. Always load equipment into rack from the bottom up.

1 **If you are using a universal 19-inch cabinet, snap an M6 square cage nut into the top and bottom holes of the location where you will be installing the rail plate as shown in the following graphic.**



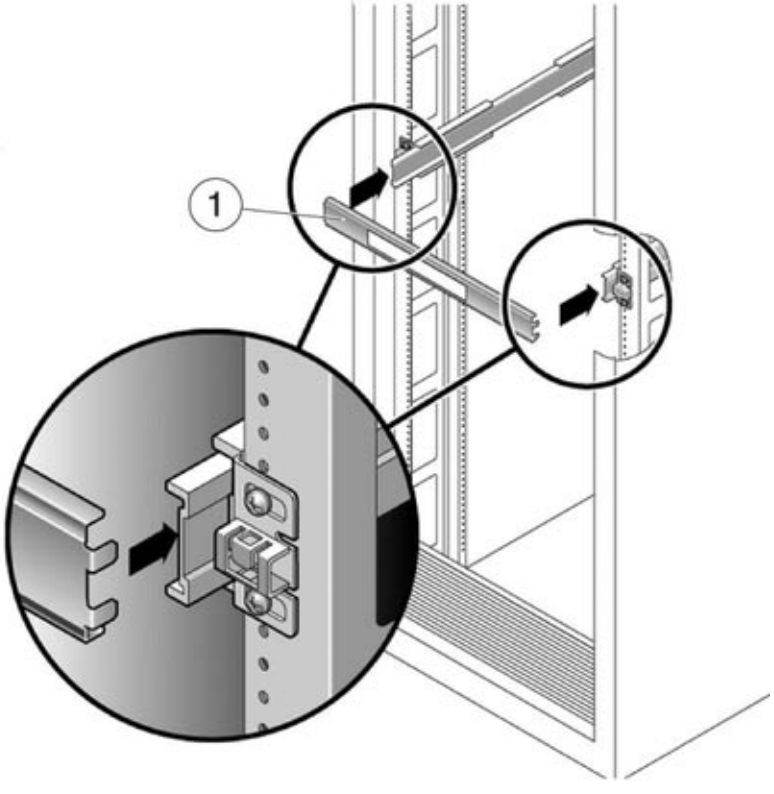
2 **Position a slide rail assembly in your rack so that the brackets at each end of the slide rail assembly are on the outside of the front and back rack posts. The following graphic illustrates**

the 7110, 7310, and 7410 rail assembly brackets.



3 Attach each slide rail assembly to the rack posts, but do not tighten the screws completely.

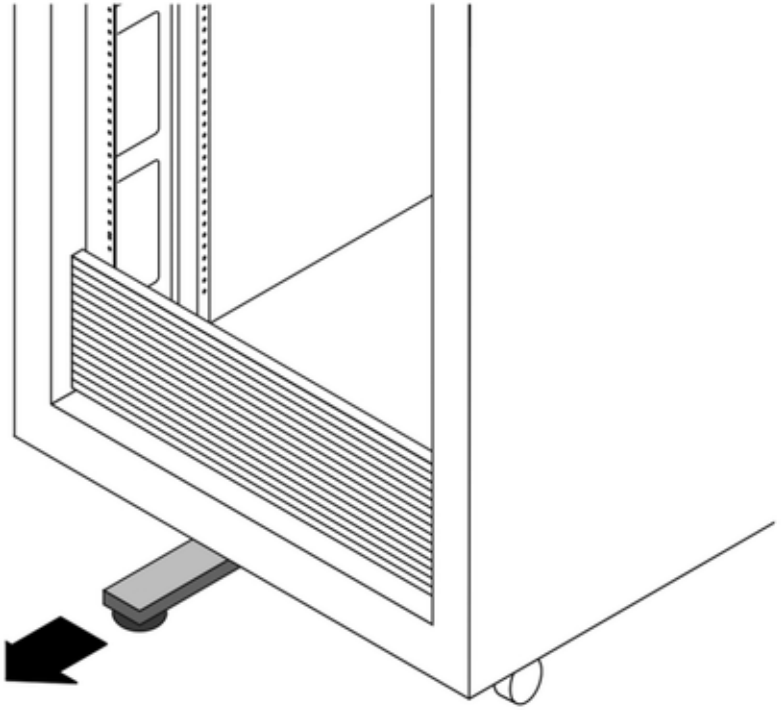
4 **From the front of the rack, set the proper width of the rails with the rail-width spacer.**



5 **Tighten the screws on the brackets.**

6 **Remove the spacer and confirm that the rails are attached tightly to the rack.**

7 **If your rack includes an anti-tip foot, extend it from the bottom of the rack.**

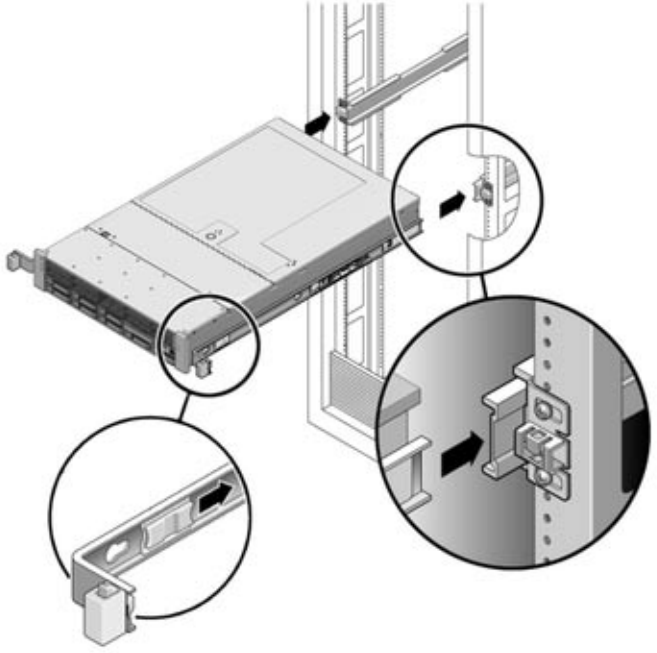


8 **If you are installing a 7110, 7310, or 7410, push the slide rails into the slide rail assemblies in the rack as far as possible. If you are installing a 7210, pull the middle rail ball bearing retainers to the front of both slide rails, securing them with the green latch.**

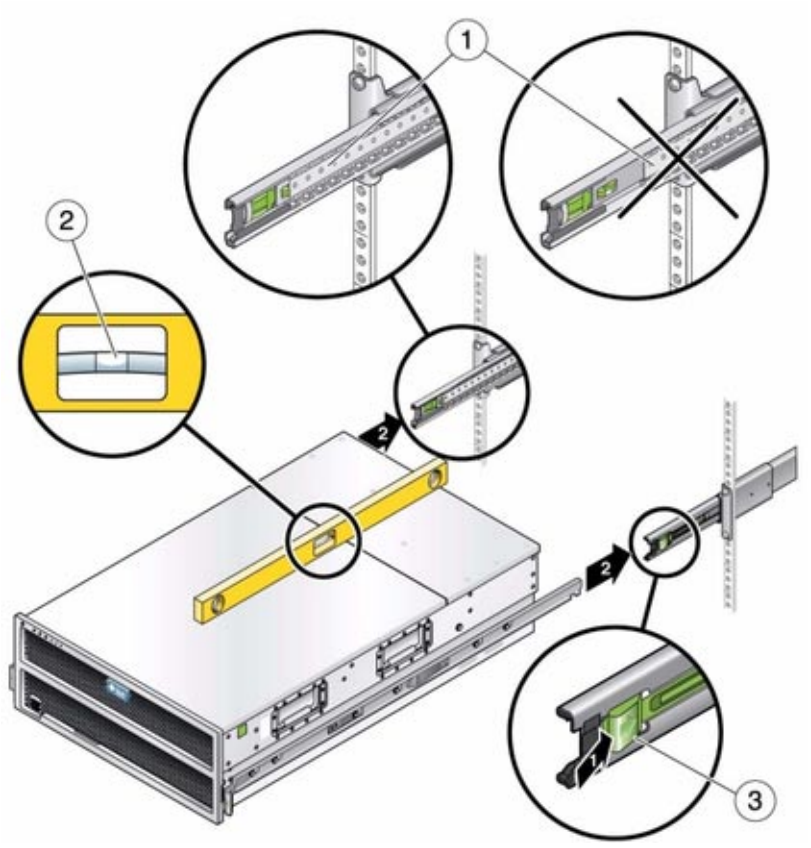
9 **Raise the chassis so that the back ends of the mounting brackets are aligned with the slide rail assemblies that are mounted in the equipment rack.**

10 **Insert the chassis with mounting brackets into the slide rails, then push the chassis into the rack slowly, until the mounting brackets meet the slide rail stops (approximately 12 inches, or 30 cm).**

11 The following graphic illustrates 7110, 7310, and 7410 chassis insertion.



12 The following graphic illustrates 7210 chassis insertion.

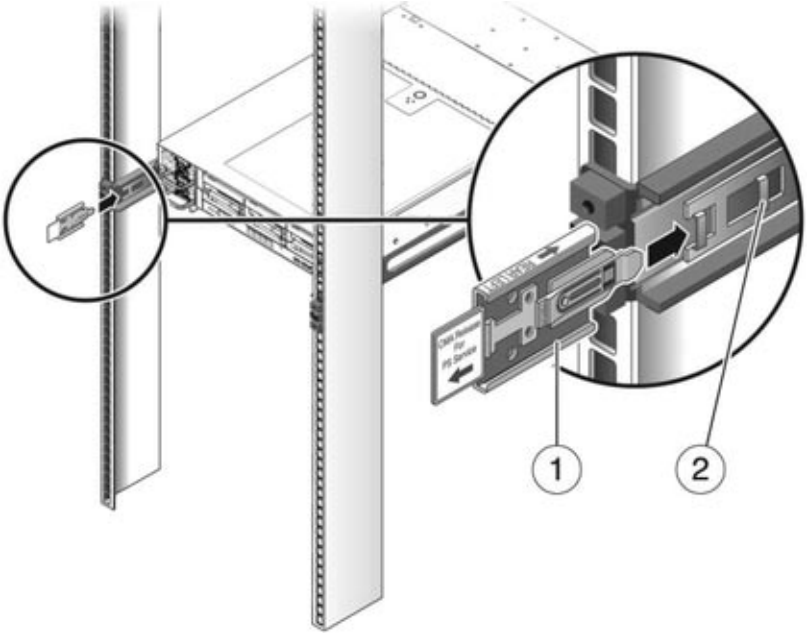


13 Simultaneously push and hold the slide rail release buttons on each mounting bracket while you push the chassis into the rack. When the slide rail locks on the front of the mounting-brackets engage with the slide rail assemblies, you will hear an audible click.

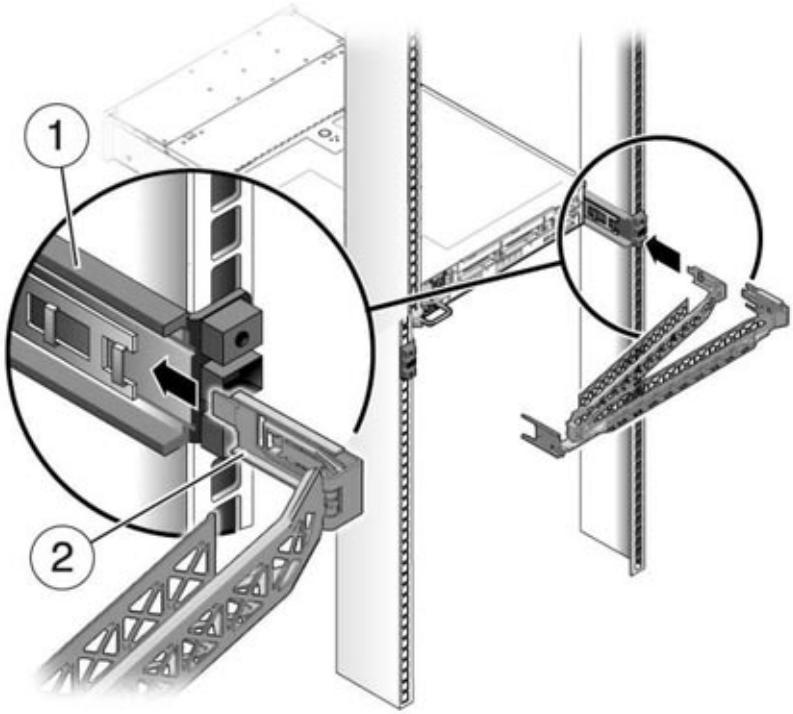
▼ Installing the Cable Management Assembly (CMA)

This procedure is completed from the back of the equipment rack.

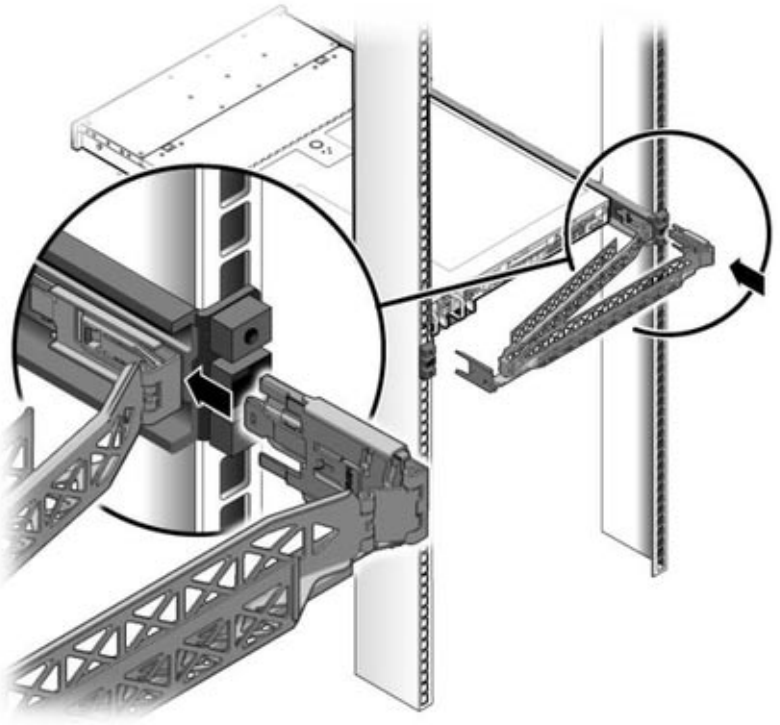
1 Attach the CMA rail extension to the left slide rail until the extension locks into place.



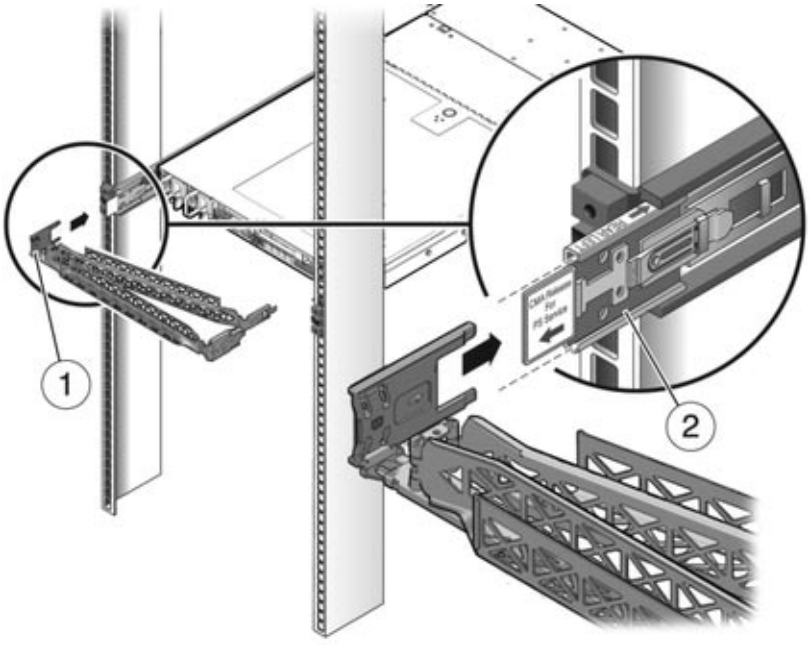
2 Insert the CMA mounting bracket connector into the right slide rail until the connector locks into place.



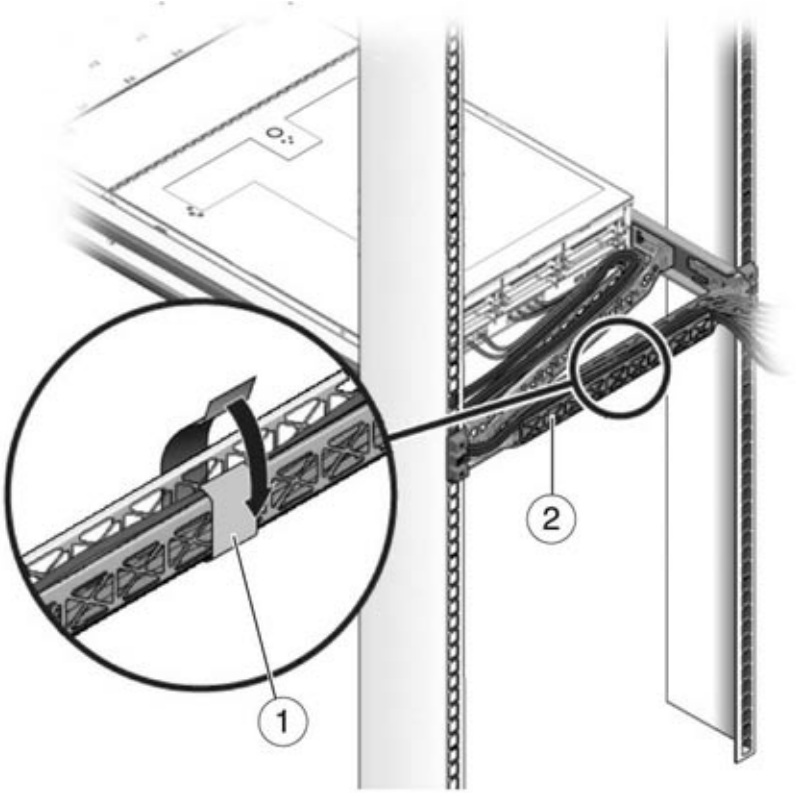
3 **Insert the right CMA slide rail connector into the right slide rail assembly until the connector locks into place.**



4 Insert the left CMA slide rail connector into the rail extension on the left slide rail assembly until the connector locks into place.



5 **After you install and route the cables through the assembly, attach the hook and loop straps to secure the cables. Then attach the right and left outer latches to support the assembly.**



Shelf

Disk Shelf Installation

This section describes how to install the J4400, J4500 or Sun Disk Shelf-24x3.5" SAS-2 into a rack using the rail assembly in the bolt-on rack mount kit. Note that if your rack mount kit shipped with installation instructions, use those instructions instead.

Observe the following cautions:

- Always load equipment into a rack from the bottom up so that it will not become top-heavy and tip over. Deploy the anti-tip bar to the prevent the rack from tipping during equipment installation.

- Ensure that the temperature in the rack does not exceed the controller's maximum ambient rated temperatures. Consider the total airflow requirements of all equipment installed in the rack to ensure that the equipment is operated within its specified temperature range.

Prerequisites

Refer to the poster that shipped with the product or the System Service Manual located on http://wikis.sun.com/display/fishworks (`http://wikis.sun.com/display/fishworks`) for an overview of your disk shelf.

- Disk Shelf Overview - view component diagrams and specifications

Use one of the following racks for the J4400 or Sun Disk Shelf.

- Sun Rack 900/1000 cabinet
- Sun Fire cabinet
- Sun StorEdge Expansion cabinet
- Sun Rack II 1042/1242 cabinet (Sun Disk Shelf-24x3.5" SAS-2 only)
- Any 19-inch wide, 4-post, EIA-compatible rack or cabinet with a front-to-back depth between vertical cabinet rails of 61 cm to 91 cm (24 in. to 36 in.). The cabinet can have threaded or unthreaded cabinet rails.

Use a rack that meets the following standards for the J4500.

- Four-post structure (mounting at both front and rear). Note that two-post racks and two-post racks converted to four-post racks are not compatible.
- Rack horizontal opening and unit vertical pitch conforming to ANSI/EIA 310-D- 1992 or IEC 60927 standards.
- Distance between front and rear mounting planes between 23 and 34 inches (580 mm and 870 mm).
- Minimum clearance depth (to front cabinet door) in front of front rack mounting plane: 1.85 inches (47 mm).
- Minimum clearance depth (to rear cabinet door) behind front rack mounting plane: 33.5 inches (851 mm) without cable management arm (a cable management arm is not included or supported with this product). The Sun Storage J4500 shelf fits best in 1000 mm racks. Sun recommends using the Sun Rack 1000-42 and Sun Rack 1000-38.
- Minimum clearance width between the structural supports and cable troughs: 19inches (483 mm).
- Minimum clearance width (not between structural supports and cable troughs) between front and rear mounting planes: 18 inches (456 mm).

Position the rack next to the rack where the controller is installed, if separate. Stabilize the cabinet and lock the casters.

Tasks

Shelf Tasks

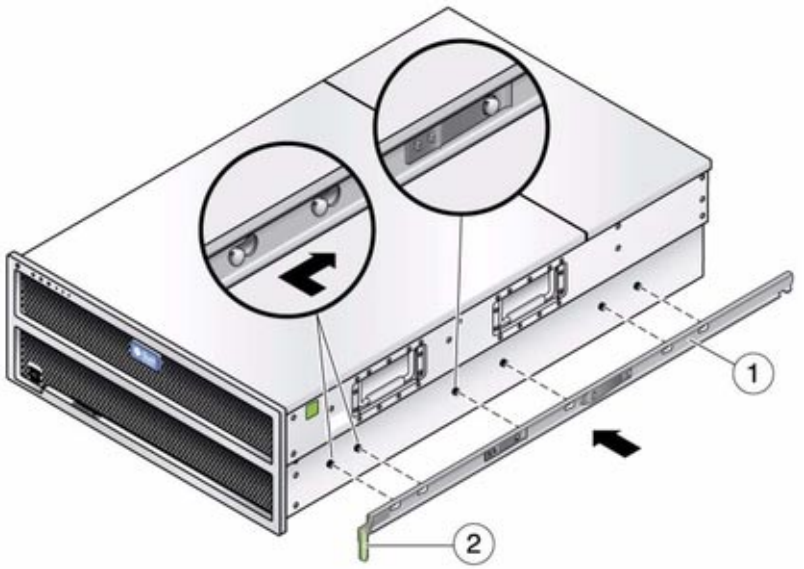
▼ Installing the Disk Shelf into the Rack Slide Rails

You will need a No. 2 Phillips head screwdriver that is a minimum of 4-inches in length.

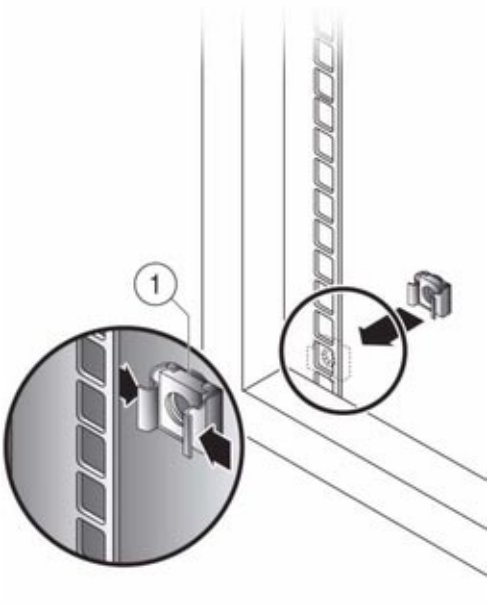
A mechanical lift is highly recommended for the J4500 and Sun Disk Shelf because either shelf can weigh between 91 to 170 pounds (42-77kg). At least three people are required, two to install the shelf and one spotter to engage the rails. If a mechanical lift is not available, remove the power supplies, SIM boards and hard disk drives to reduce the weight, see Disk Shelf Maintenance Procedures for instructions included in the System Service Manual on http://wikis.sun.com/display/fishworks. (`http://wikis.sun.com/display/fishworks.`)

1. **Starting at the bottom of the cabinet, locate the appropriate rack unit (RU) height. The J4400, J4500 and Sun Disk Shelf require four standard mounting units (4RU) of vertical space in the cabinet.**

2. **If you are installing a J4500, you will need to first attach the J4500 mounting brackets.**

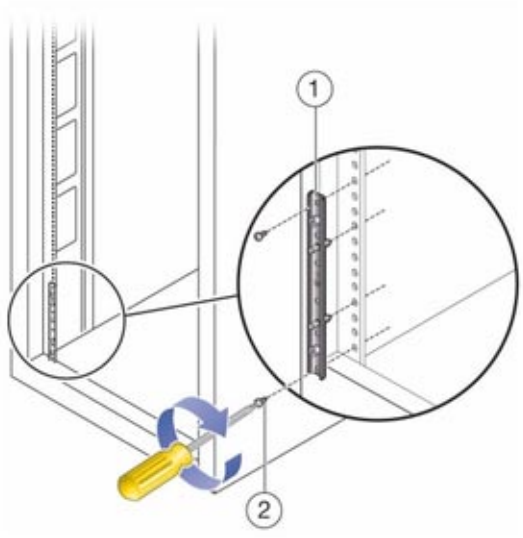


3 **If you are using a universal 19-inch or Sun Rack II cabinet, snap an M6 square cage nut into the 4U location where you will be installing the system. For J4400/Sun Disk Shelf, install in top and bottom holes. For J4500, install in bottom hole and fourth hole up from the bottom.**



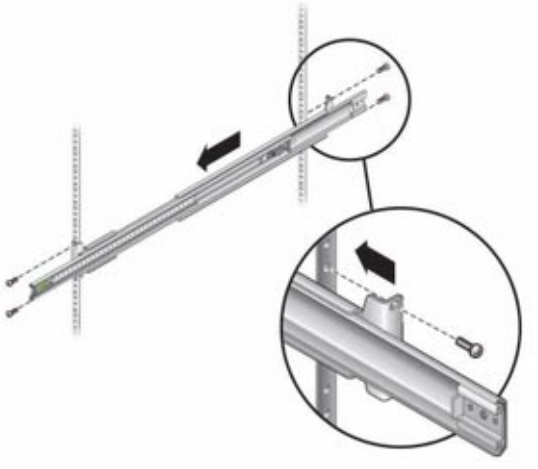
4 **For J4400/Sun Disk Shelf, install appropriate rail plates in four locations on the rack (2 front and 2 back) by aligning the two pins on the rail plate with holes on the cabinet rails.**

5 **For J4400/Sun Disk Shelf, insert M6 screws in the top and bottom holes of each rail plate and**



tighten (8 total places).

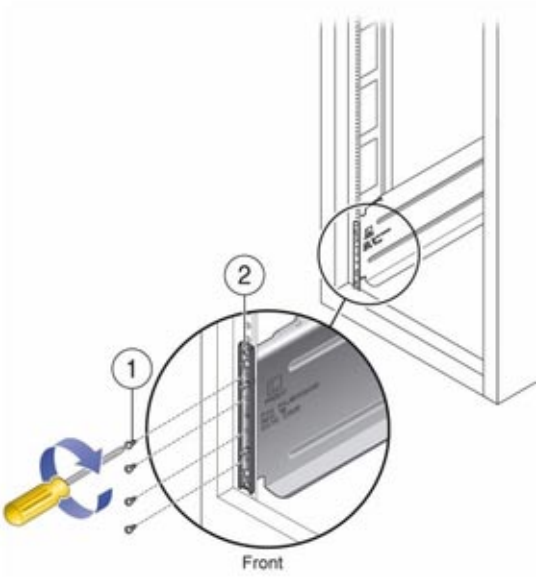
6 **For J4500, attach the slide-rail assembly, making sure you have six holes of free space above the**



bracket.

7 **For J4400/Sun Disk Shelf, install each rail by first aligning the front pins of the rack adapter plates with corresponding holes in the front of the rail, then adjust the rail to fit the rack and insert the pins from the rear rack adapter plates into the corresponding holes of the rail.**

8 **For J4400/Sun Disk Shelf, install 4 8-32 screws into the 4 remaining holes front and rear of each**



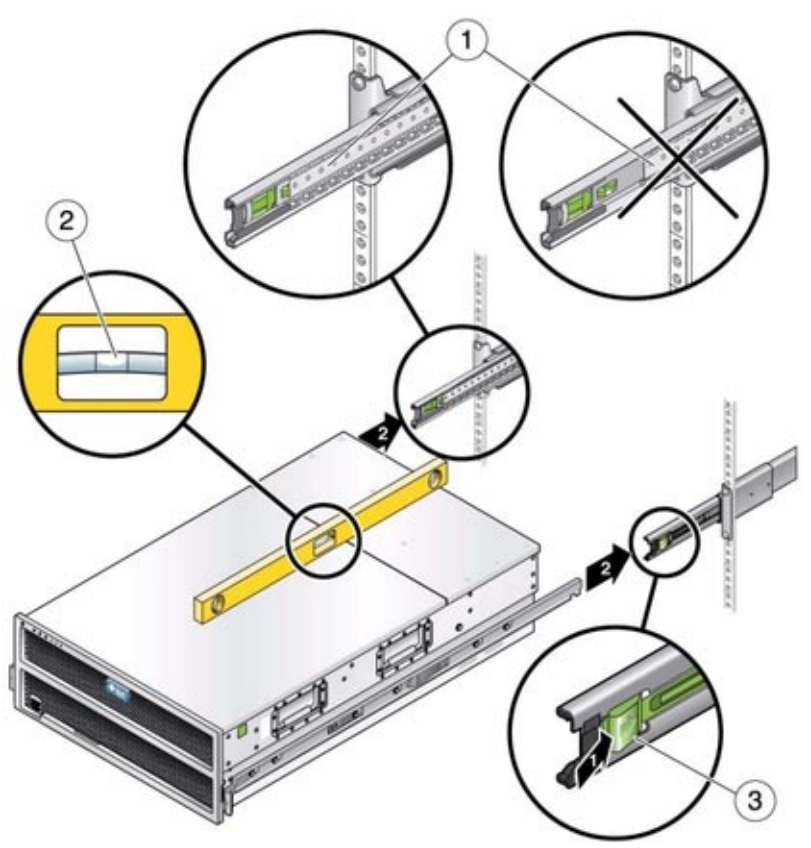
rack rail (16 total).

9 **For J4500, install 4 screws at front and back to mount each rail assembly.**

10 **For J4400/Sun Disk Shelf, using a mechanical lift or two people, one at each side of the shelf, carefully lift and rest the shelf on the bottom ledge of the left and right rails. The following**

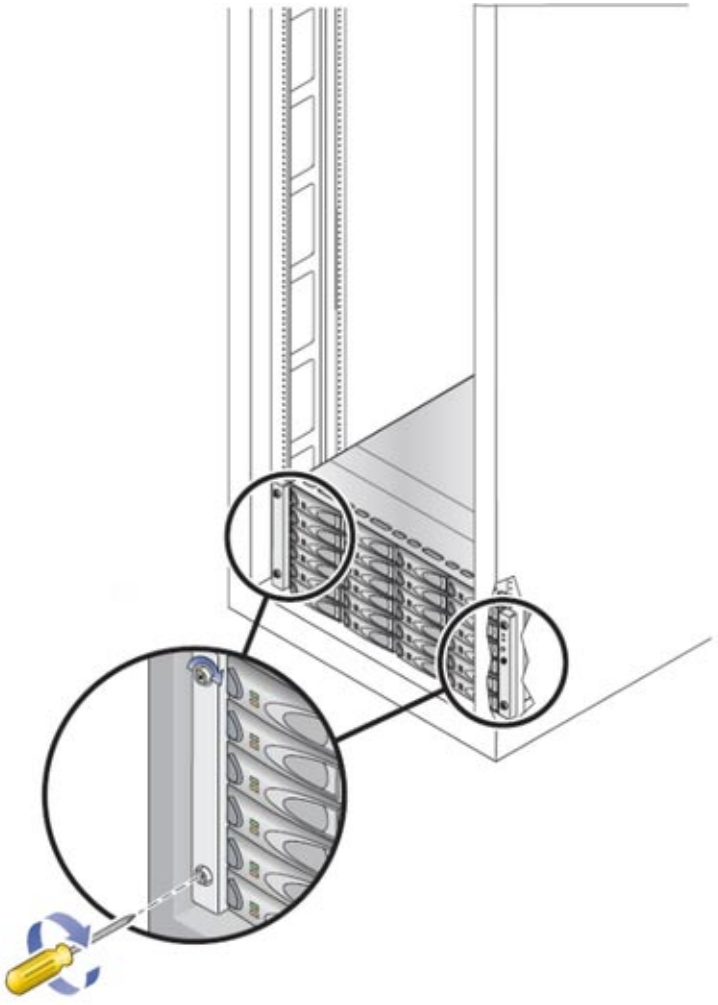
graphic illustrates the Sun Disk Shelf chassis insertion.

11 The following graphic illustrates J4500 chassis insertion.

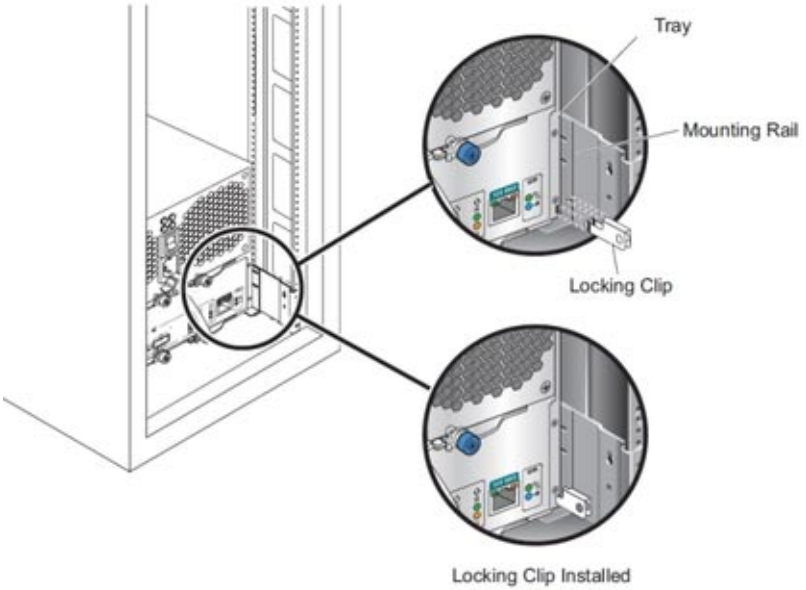


12 Carefully slide the shelf into the cabinet until the front flanges of the shelf touch the vertical face of the rack.

13 For the J4400/Sun Disk Shelf, tighten the captive screws on each side of the front of the shelf to secure the shelf to the rack. The following graphic illustrates the J4400 screws.



14 **For the J4400/Sun Disk Shelf, at the back, slide a system locking clip onto each lower corner of**



the chassis.

See Also

- Controller Installation
- 7210 Cabling Diagrams
- 7310 Cabling Diagrams
- 7410 Cabling Diagrams

Cabling

Cabling Diagrams

The diagrams in the sections that follow illustrate how to properly connect storage controllers, either in standalone or clustered configurations, to one or more disk shelves for storage expansion. Use the images as a key to understanding how the abstracted diagrams correspond to actual hardware:

- Connecting Expansion Storage to the 7210
- Connecting Expansion Storage to the 7310
- Connecting Expansion Storage to the 7310 Cluster
- Connecting Expansion Storage to the 7410 (2 HBAs)
- Connecting Expansion Storage to the 7410 (3 HBAs)
- Connecting Expansion Storage to the 7410 Cluster (2 HBAs)
- Connecting Expansion Storage to the 7410 Cluster (3 HBAs)

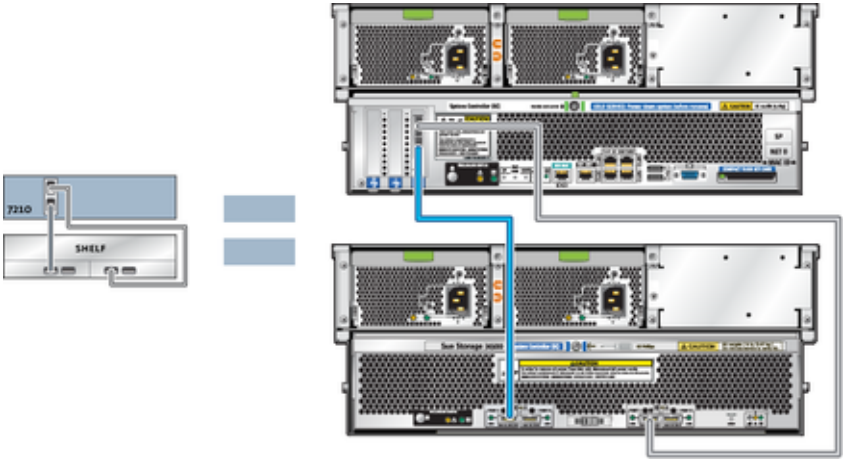
7210 Cabling

Connecting Expansion Storage to the Sun Storage 7210

The Sun Unified Storage 7210 can support up to two J4500 disk shelves. The figures below show the complete set of supported configurations, as well as steps to migrate from one state to another.

Sun Unified Storage 7210

NOTE: Cabling diagrams are **not representative** of proper slot location for HBAs.



Cabling Diagrams

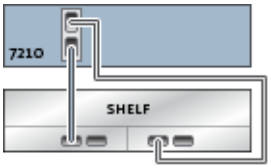
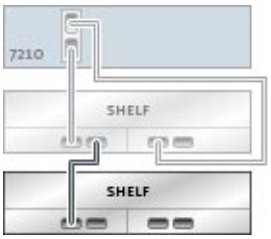
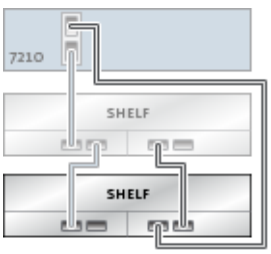


fig.1 Sun Unified Storage 7210 system with one J4500 disk shelf





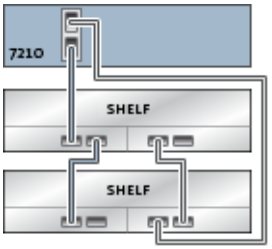


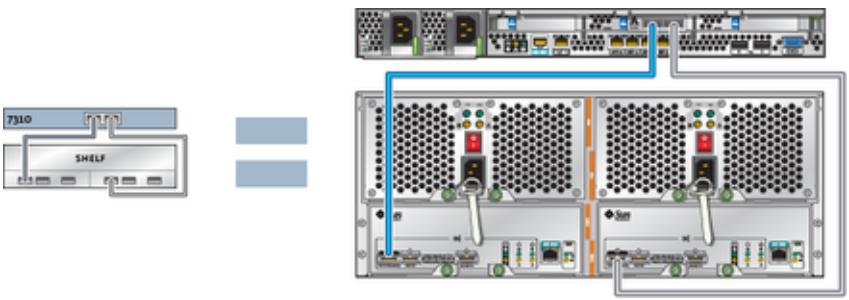
fig.2 Sun Unified Storage 7210 system with two J4500 disk shelves

7310 Cabling

Connecting Expansion Storage to the Sun Storage 7310

The Sun Unified Storage 7310 can support up to four J4400/Sun Disk shelves. The figures below show the complete set of supported configurations, as well as steps to migrate from one state to another.

NOTE: Cabling diagrams are **not representative** of proper slot location for HBAs.



Cabling Diagrams

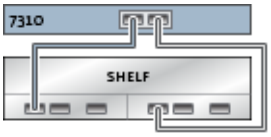
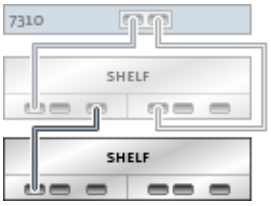
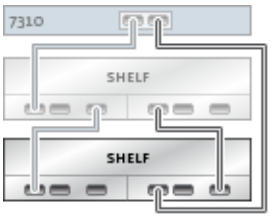


fig.1 Sun Unified Storage 7310 with one J4400/Sun Disk shelf





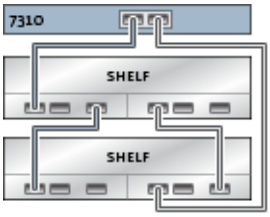


fig.2 Sun Unified Storage 7310 with two J4400/Sun Disk shelves

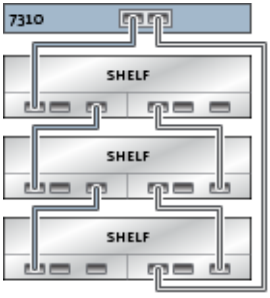


fig.3 Sun Unified Storage 7310 with three J4400/Sun Disk shelves

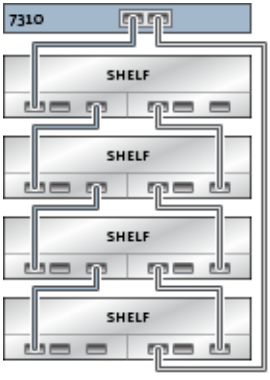


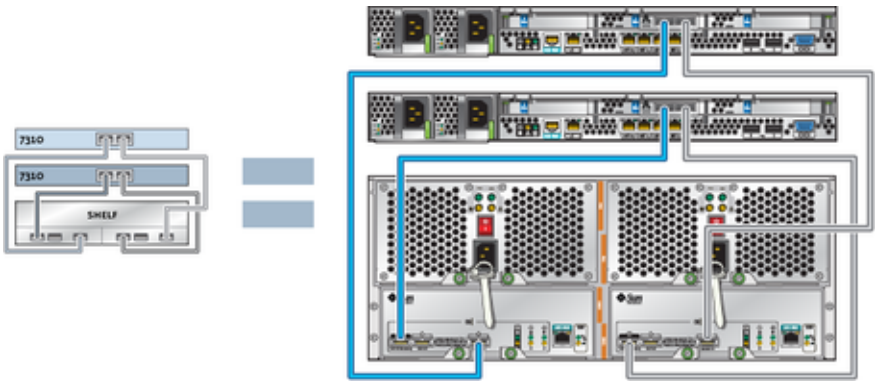
fig.4 Sun Unified Storage 7310 with four J4400/Sun Disk shelves

7310 Cluster Cabling

Connecting Expansion Storage to the Sun Storage 7310 Cluster

The Sun Unified Storage 7310 cluster can support up to four J4400/Sun Disk shelves. The figures below show the complete set of supported redundant cluster configurations, as well as steps to migrate from one state to another.

NOTE: Cabling diagrams are **not representative** of proper slot location for HBAs.



Cabling Diagrams

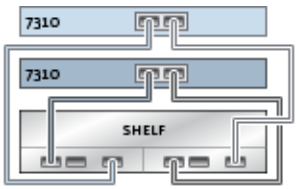


fig.1 Sun Unified Storage 7310 cluster with one J4400/Sun Disk shelf

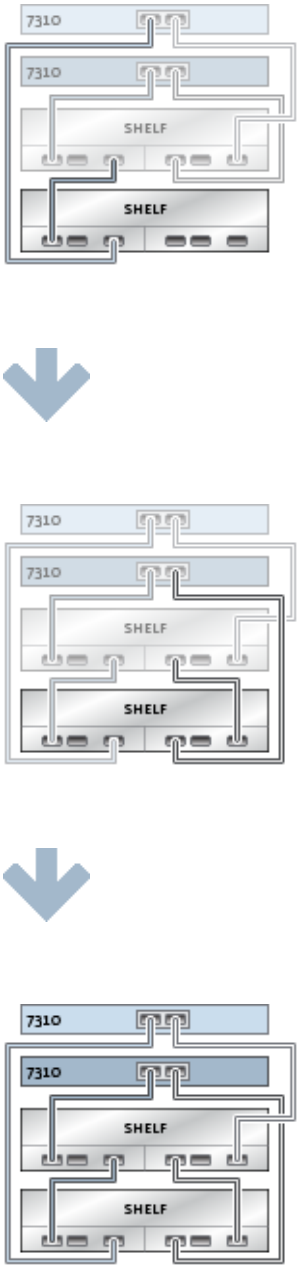


fig.2 Sun Unified Storage 7310 cluster with two J4400/Sun Disk shelves

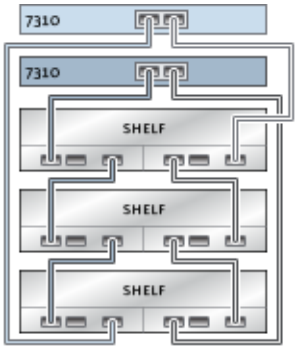


fig.3 Sun Unified Storage 7310 cluster with three J4400/Sun Disk shelves

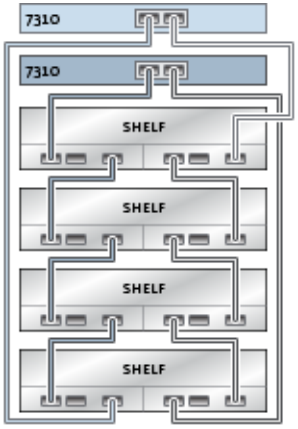


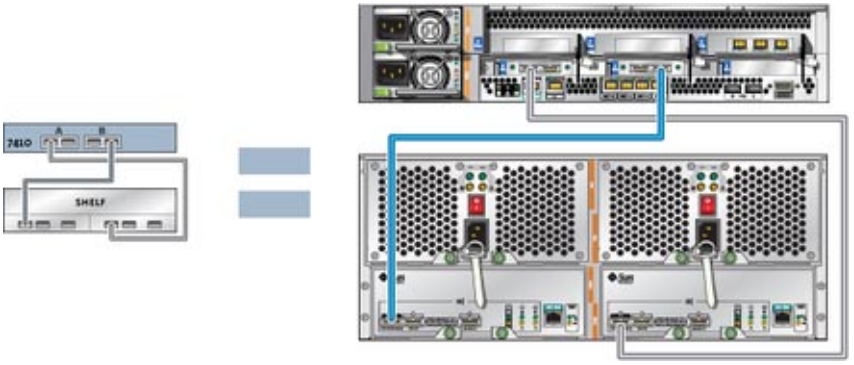
fig.4 Sun Unified Storage 7310 cluster with four J4400/Sun Disk shelves

7410 Cabling pt.1

Connecting Expansion Storage to the Sun Storage 7410

The Sun Unified Storage 7410 is available with either two or three HBA cards installed, each of which can support up to four J4400/Sun Disk shelves. The figures below show a representative sample of stable, balanced configurations with two HBAs, as well as steps to migrate from one state to another.

NOTE: Diagrams below are **not representative** of proper slot location for HBAs.



Cabling Diagrams

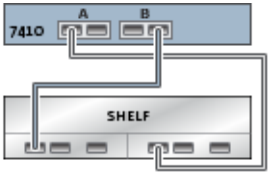


fig.1 Sun Unified Storage 7410 with two HBAs and one J4400/Sun Disk shelf

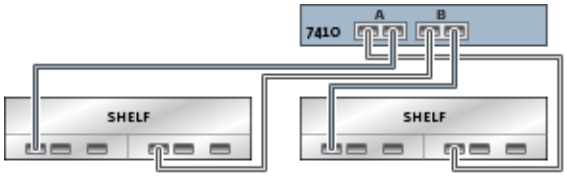
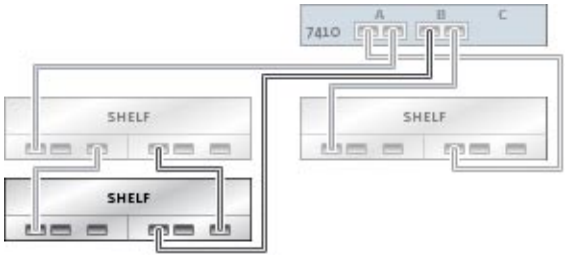


fig.2 Sun Unified Storage 7410 two HBAs and with two J4400/Sun Disk shelves



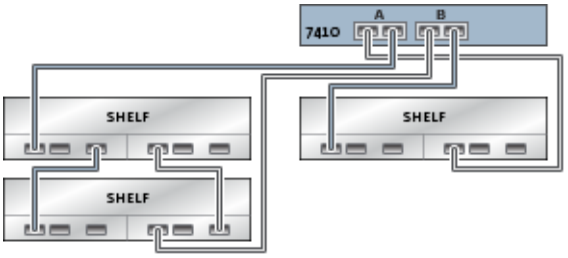


fig.3 Sun Unified Storage 7410 with two HBAs and three J4400/Sun Disk shelves

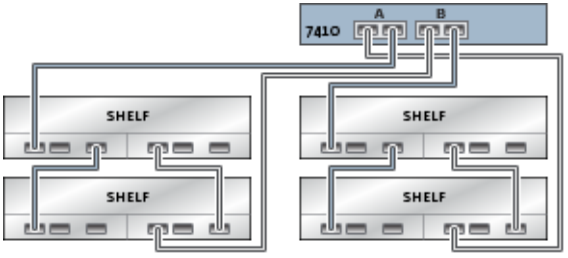


fig.4 Sun Unified Storage 7410 with two HBAs and four J4400/Sun Disk shelves

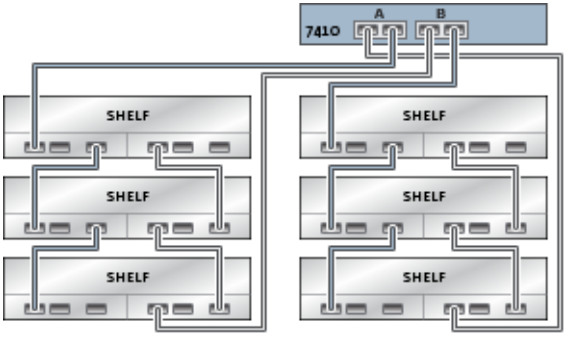


fig.5 Sun Unified Storage 7410 with two HBAs and six J4400/Sun Disk shelves

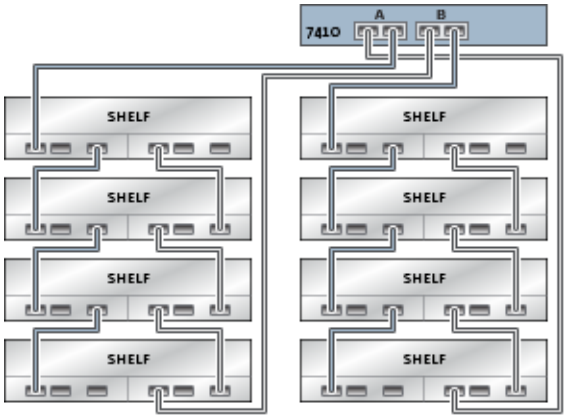


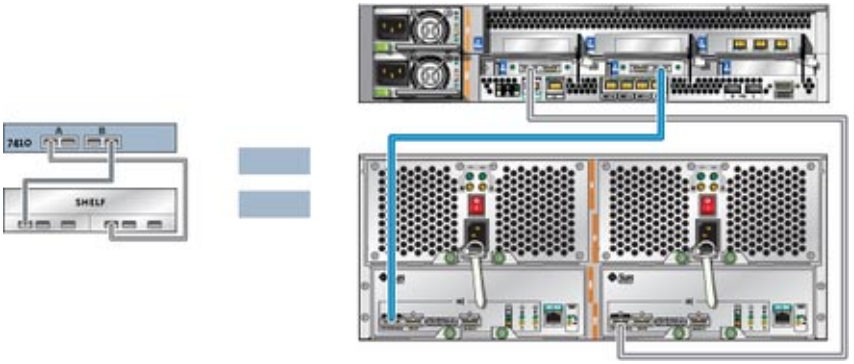
fig.6 Sun Unified Storage 7410 with two HBAs and eight J4400/Sun Disk shelves

7410 Cabling pt.2

Connecting Expansion Storage to the Sun Storage 7410 (cont.)

The Sun Unified Storage 7410 is available with either two or three HBA cards installed, each of which can support up to four J4400/Sun Disk shelves. The figures below show a representative sample of stable, balanced configurations with three HBAs, as well as steps to migrate from one state to another.

NOTE: Diagrams below are **not representative** of proper slot location for HBAs.



Cabling Diagrams

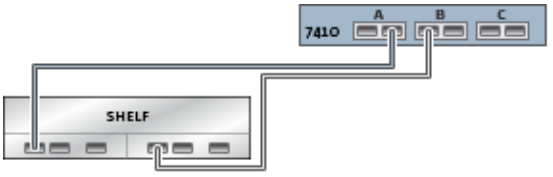


fig.1 Sun Unified Storage 7410 with three HBAs and one J4400/Sun Disk shelf

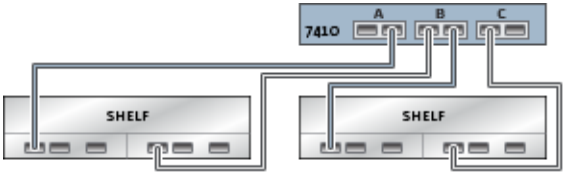


fig.2 Sun Unified Storage 7410 with three HBAs and two J4400/Sun Disk shelves

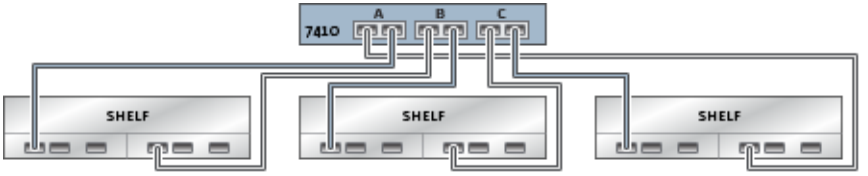
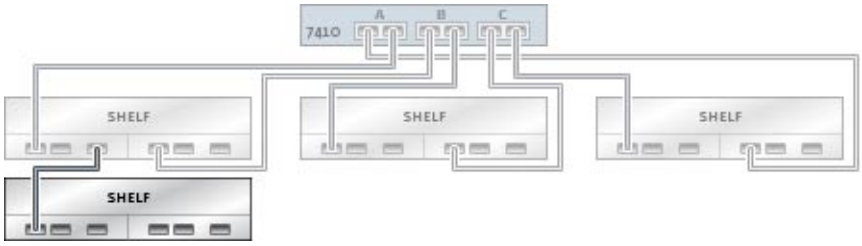
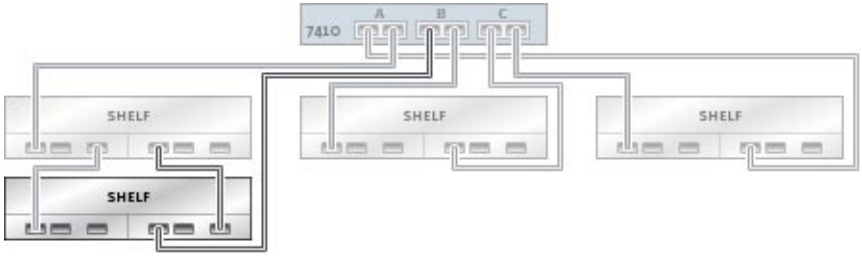


fig.3 Sun Unified Storage 7410 with three HBAs and three J4400/Sun Disk shelves


7410
A
B
C
SHELF
SHELF
SHELF
SHELF


7410
A
B
C
SHELF
SHELF
SHELF
SHELF

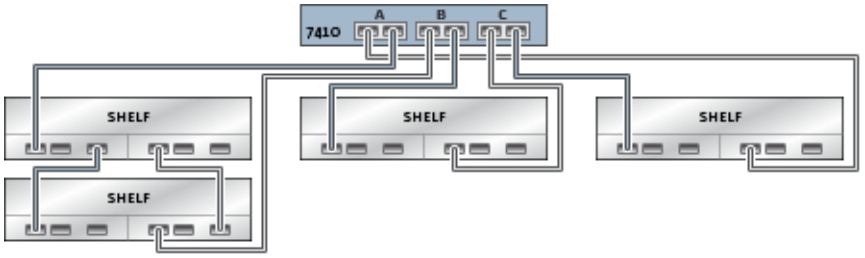


fig.4 Sun Unified Storage 7410 with three HBAs and four J4400/Sun Disk shelves

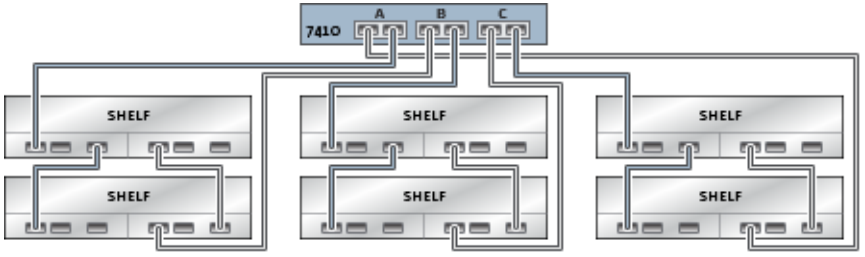


fig.5 Sun Unified Storage 7410 with three HBAs and six J4400/Sun Disk shelves

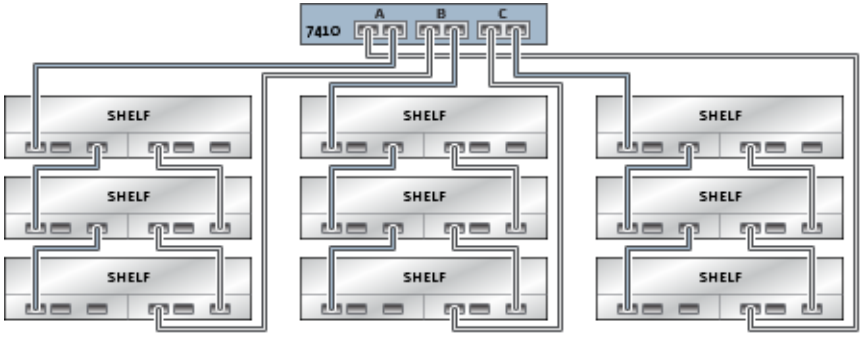


fig.6 Sun Unified Storage 7410 with three HBAs and nine J4400/Sun Disk shelves

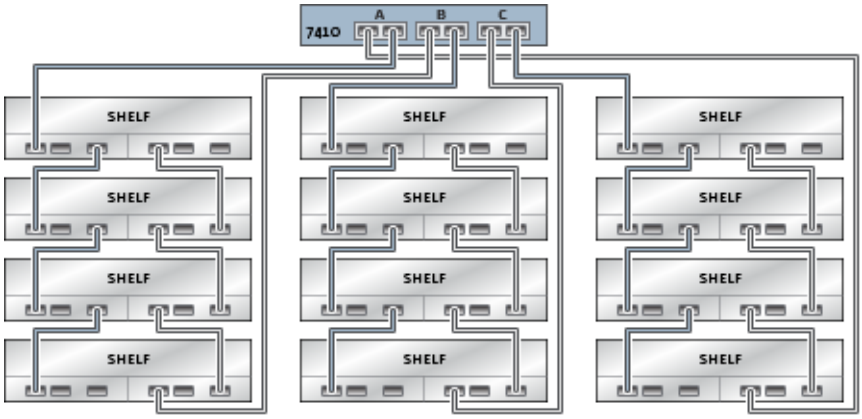


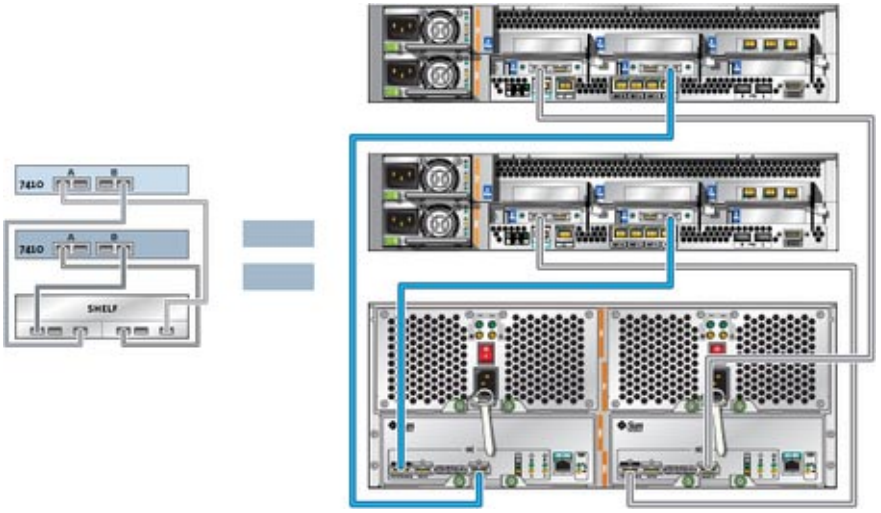
fig.7 Sun Unified Storage 7410 with three HBAs and twelve J4400/Sun Disk shelves

7410 Cluster Cabling pt.1

Connecting expansion storage to the Sun Storage 7410 Cluster

The Sun Unified Storage 7410 cluster is available with either two or three HBA cards installed, each of which can support up to four J4400/Sun Disk shelves. The figures below show a representative sample of stable, balanced and redundant cluster configurations with two HBAs, as well as steps to migrate from one state to another.

NOTE: Diagrams below are **not representative** of proper slot location for HBAs.



Cabling Diagrams

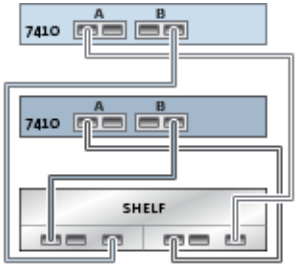


fig.1 Sun Unified Storage 7410 cluster with two HBAs and one J4400/Sun Disk shelf

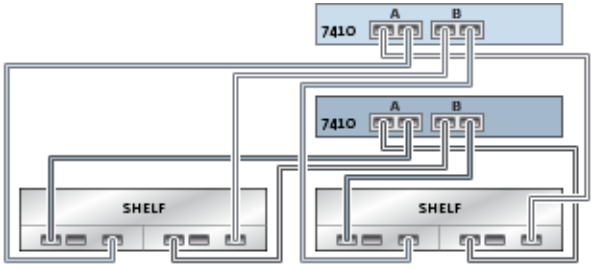
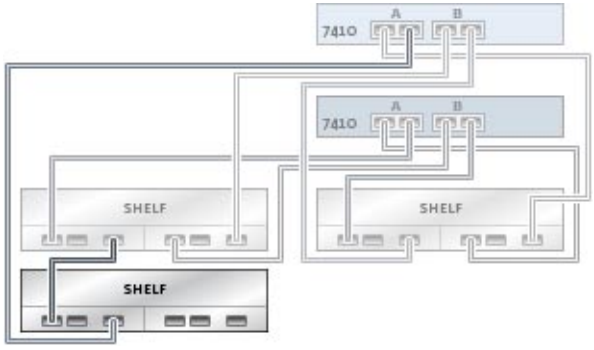
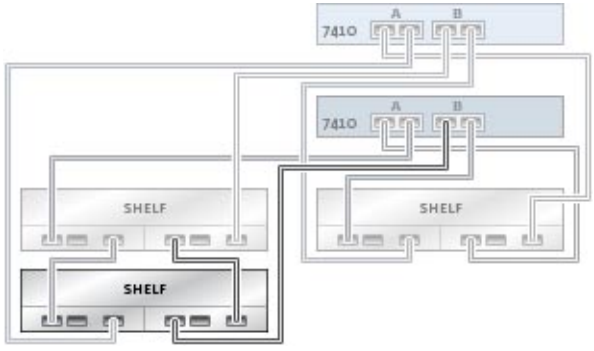


fig.2 Sun Unified Storage 7410 cluster with two HBAs and two J4400/Sun Disk shelves


7410
A
B
7410
A
B
SHELF
SHELF
SHELF


7410
A
B
7410
A
B
SHELF
SHELF
SHELF

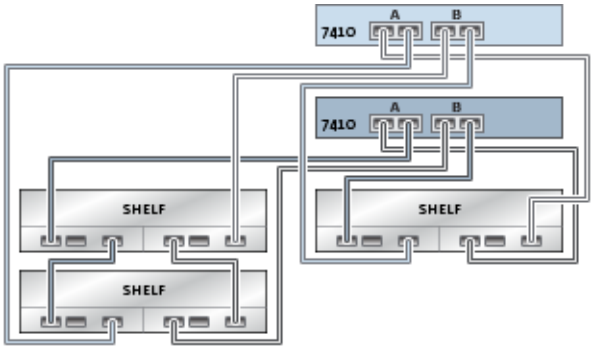


fig.3 Sun Unified Storage 7410 cluster with two HBAs and three J4400/Sun Disk shelves

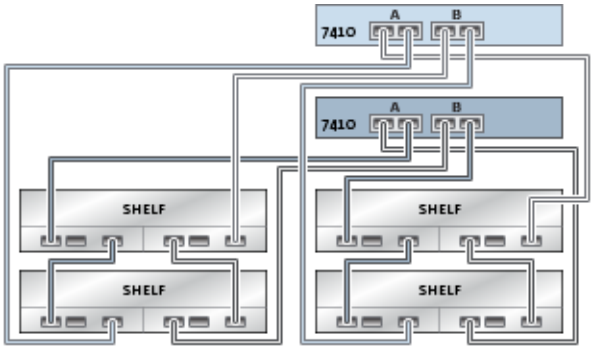


fig.4 Sun Unified Storage 7410 cluster with two HBAs and four J4400/Sun Disk shelves

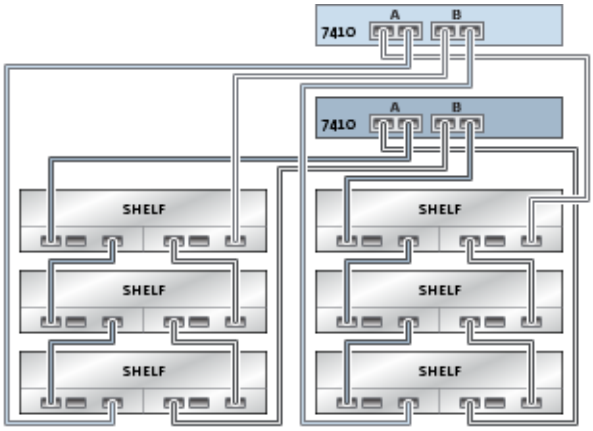


fig.5 Sun Unified Storage 7410 cluster with two HBAs and six J4400/Sun Disk shelves

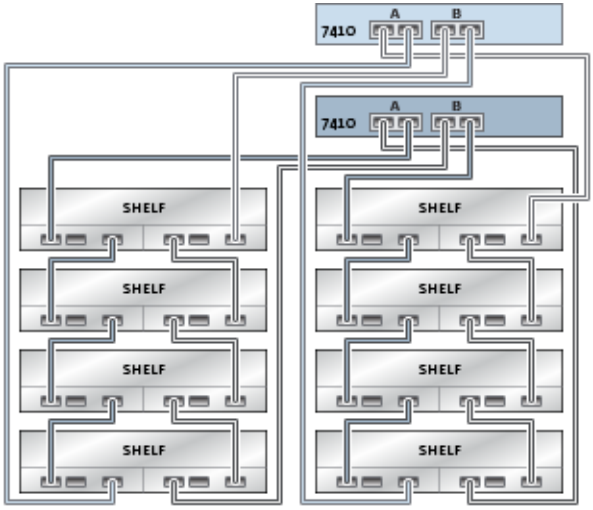


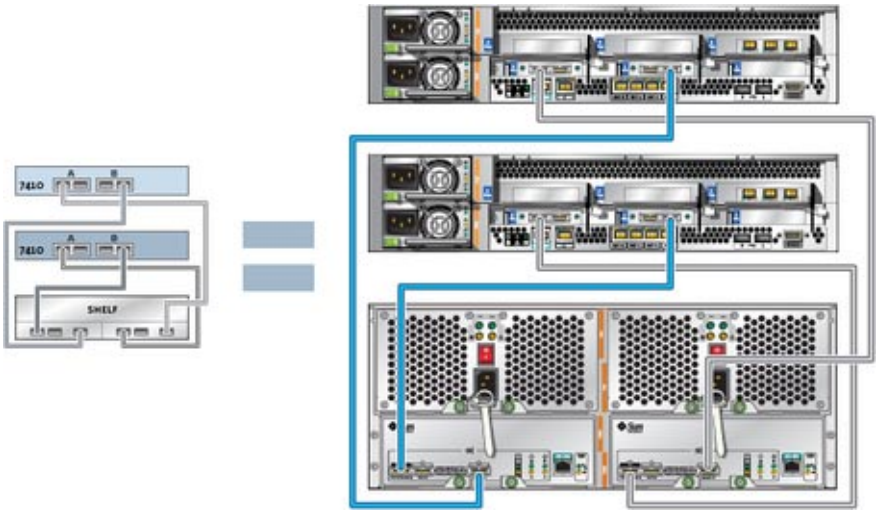
fig.6 Sun Unified Storage 7410 cluster with two HBAs and eight J4400/Sun Disk shelves

7410 Cluster Cabling pt.2

Connecting Expansion Storage to the Sun Storage 7410 Cluster (cont.)

The Sun Unified Storage 7410 cluster is available with either two or three HBA cards installed, each of which can support up to four J4400/Sun Disk shelves. The figures below show a representative sample of stable, balanced and redundant cluster configurations with three HBAs, as well as steps to migrate from one state to another.

NOTE: Diagrams below are **not representative** of proper slot location for HBAs.



Cabling Diagrams

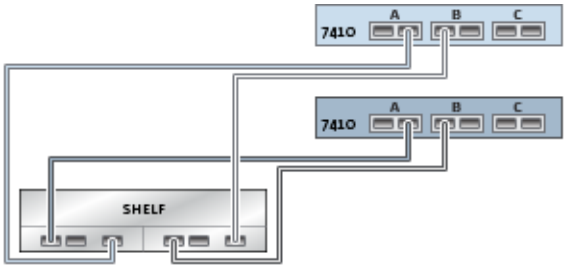


fig.1 Sun Unified Storage 7410 cluster with three HBAs and one J4400/Sun Disk shelf

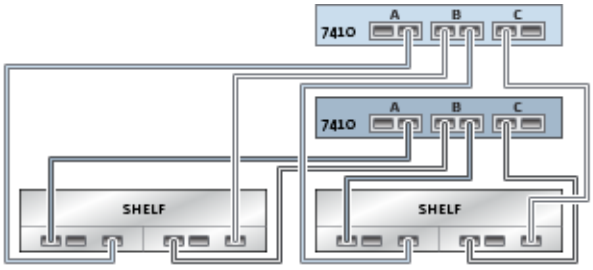


fig.2 Sun Unified Storage 7410 cluster with three HBAs and two J4400/Sun Disk shelves

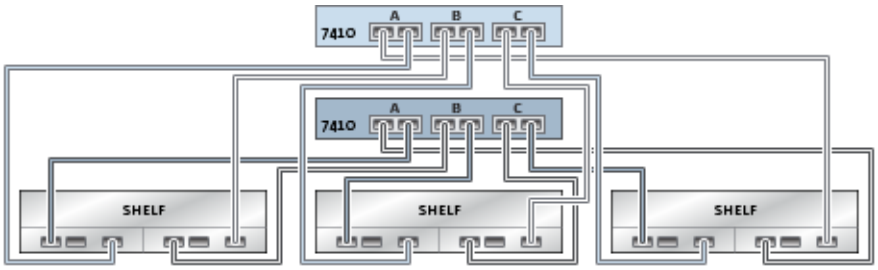
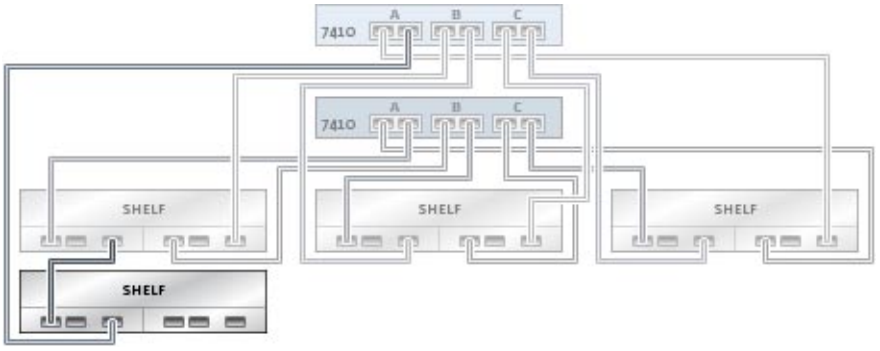
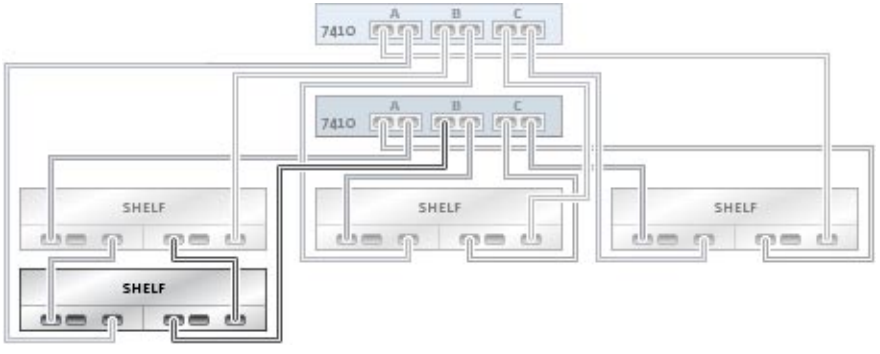


fig.3 Sun Unified Storage 7410 cluster with three HBAs and three J4400/Sun Disk shelves


7410
A
B
C
7410
A
B
C
SHELF
SHELF
SHELF
SHELF


7410
A
B
C
7410
A
B
C
SHELF
SHELF
SHELF
SHELF

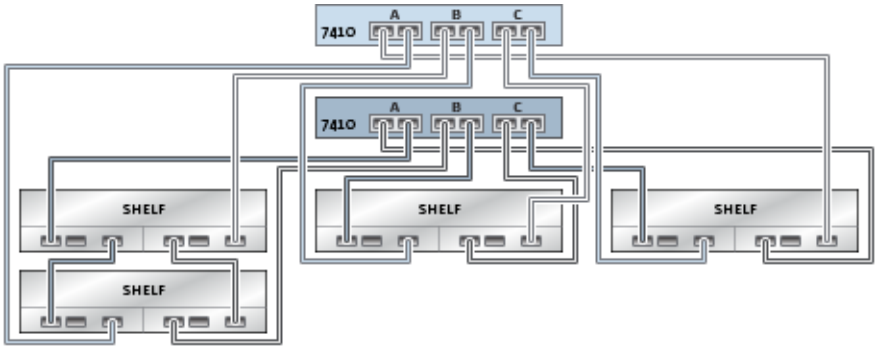


fig.4 Sun Unified Storage 7410 cluster with three HBAs and four J4400/Sun Disk shelves

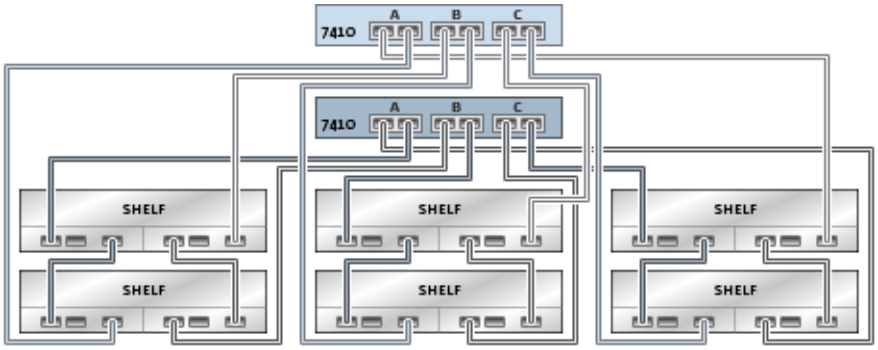


fig.5 Sun Unified Storage 7410 cluster with three HBAs and six J4400/Sun Disk shelves

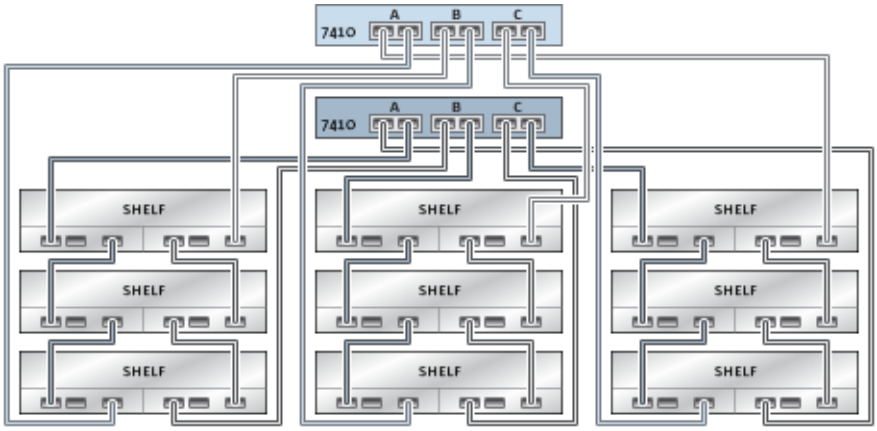


fig.6 Sun Unified Storage 7410 cluster with three HBAs and nine J4400/Sun Disk shelves

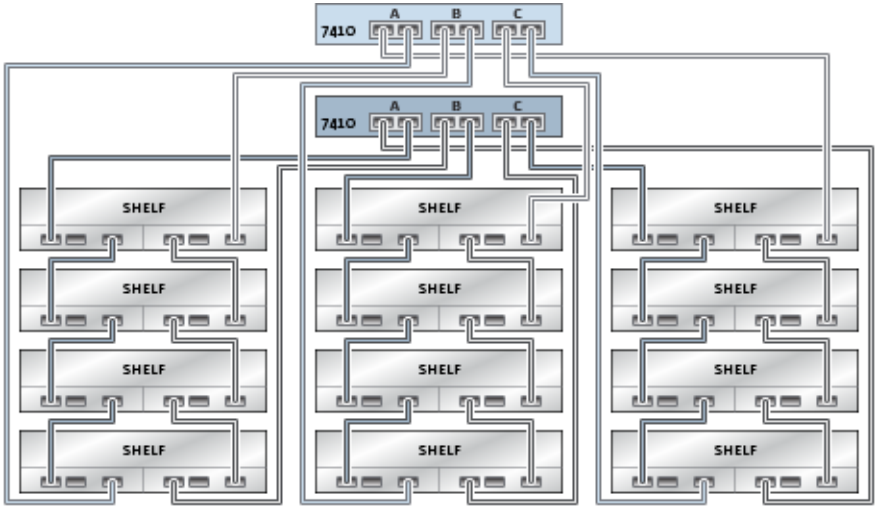


fig.7 Sun Unified Storage 7410 cluster with three HBAs and twelve J4400/Sun Disk shelves

Power

Powering On and Configuring the Appliance

This section provides instructions for configuring the primary network interface using the preinstalled Unified Storage System command line interface (CLI). After you configure the primary interface, configure the remaining system parameters using the browser user interface (BUI) from any client on the same network.

Prerequisites

Refer to the Disk Shelf Installation and Controller Installation pages for detailed instructions to install your system in the rack. Complete the system cabling according to the Cabling Diagrams section.

Gather the following information in preparation for configuring an Ethernet interface on the storage controller.

- IP address
- IP netmask
- Host name
- Domain Name Server (DNS) domain name
- DNS server IP address
- Default router IP address
- Password

If you will access the appliance through an administrative client, configure the administrative client with the following settings:

- 8N1: eight data bits, no parity, one stop bit
- 9600 baud
- Disable hardware flow control (CTS/RTS)
- Disable software flow control (XON/XOFF)

Refer to the poster that shipped with the product or the following sections in the System Service Manual located on http://wikis.sun.com/display/fishworks (`http://wikis.sun.com/display/fishworks`) for an overview of your system controller.

- 7110 Overview
- 7210 Overview
- 7310 Overview
- 7410 Overview

Tasks

Power Tasks

▼ Powering On the Appliance

You can access the system by connecting an administrative client to the serial management port on the controller. Alternatively, if there is a Dynamic Host Configuration Protocol (DHCP) server on the network, you can access the system by connecting the network management port to your network.

Note that if you are installing a cluster, configure only one controller initially. The software propagates the configuration to the peer controller during cluster initialization. After the cluster is initialized, you can administer the system from either storage controller. However, do not attempt initial configuration on both controllers independently. Refer to the Cluster documentation in the System Administration Guide located on http://wikis.sun.com/display/fishworks (`http://wikis.sun.com/display/fishworks`) for more information.

1. **If you are using an administrative client to access the appliance, connect a serial cable from the SER MGT port on the back panel of the controller to the serial port on the administrative client. Use the DB9 to RJ45 adapter if necessary.**
2. **If you are using the network to access the appliance, connect an Ethernet cable from the NET MGT port on the back panel of the controller to your network.**
3. **Connect an Ethernet cable from your network to the NET0 port on the back panel of the controller.**
4. **Power on any disk shelves attached to the storage system by plugging the two power cords into the universal power connectors, connecting the cords to the external power source and turning on the disk shelf power switches. Wait several minutes until the power indicators are lit a steady green.**
5. **Connect power cables to power supply 0 and power supply 1 on the storage controller(s) and wait until the Power/OK LED on the front panel next to the Power button lights and remains lit (approximately two minutes).**
6. **Open a terminal window or terminal emulator and issue either the `telnet` or `ssh` command, as follows:**
7. **For serial port concentrator, use root as the user name and replace serial-concentrator portnumber with the appropriate value: `telnet serial-concentrator portnumber`**

8. **For network connection, use root as the user name and determine the IP address by accessing your DHCP server for the address assigned to the SP MAC address: `ssh root@192.168.128.256`**

9. **Type the password `changeme` when prompted.**

10. **At the command prompt, type `start /SP/console`.**

11. **Type `y` to confirm that you want to start the console.**

12. **Press any key to begin configuring the appliance. The shell interface configuration screen appears. NET-0 at the top of the screen should be underlined.**

13. **Verify the information on the screen, or enter values that do not appear.**

14. **Apply the values by pressing ESC-1 or the F1 key or by pressing Enter after confirming the password. The final shell configuration screen appears, confirming that your appliance is ready for further configuration using the BUI.**

▼ Completing Configuration

Configure the remaining system parameters through a browser running on any client on the same network as the initial interface. The management software is designed to be fully featured and functional on the following supported web browsers: Firefox 2.x and 3.x, Internet Explorer 7, Internet Explorer 8, Safari 3.1 or later, and WebKit 525.13 or later.

1. **Direct your browser to the system using either the IP address or host name you assigned to the NET0 port as follows: https://*ipaddress*:215 or https://*hostname*:215. The login screen appears.**

2. **Type `root` into the Username field and the administrative password that you entered into the appliance shell kit interface and press the Enter key. The Welcome screen appears.**

3. **To begin configuring the system, click Start on the Welcome screen. You are guided through the Initial Configuration of the remaining network interfaces, DNS, time settings, directory service and storage.**

Next Steps

- Initial Configuration

Initial

Initial Configuration

The initial configuration consists of six configuration steps.

1. Network
2. DNS
3. Time
4. Name Services (NIS, LDAP, Active Directory)
5. Storage
6. Registration & Support

Prerequisites

The initial configuration of the system is conducted after powering it on for the first time and establishing a connection, as documented in the Installation section, also available as a PDF on http://wikis.sun.com/display/fishworks/Documentation. (`http://wikis.sun.com/display/fishworks/Documentation.`)

`Note` that the option to perform initial configuration of a cluster is only available in the BUI. If electing this option, read the clustering documentation before beginning initial configuration for detailed additional steps that are required for successful cluster setup. Alternatively, cluster-capable appliances may be initially configured for standalone operation using the following procedure and re-configured for cluster operation at a later time.

Summary

This procedure will configure networking connectivity, several client network services, and the layout of the storage pool for standalone operation. When completed, the appliance is ready for use - but may not have any shares configured for remote clients to access. See the Shares section for how to create shares. Refer to the Configuration section for other available settings and to revisit those from the initial configuration. See http://wikis.sun.com/display/fishworks (`http://wikis.sun.com/display/fishworks`) for the Shares and Configuration sections of the System Administration Guide.

This procedure may be repeated at a later time by clicking the "INITIAL SETUP" button on the System screen or by entering the `maintenance system setup` context in the CLI.

BUI

The BUI initial configuration wizard provides a screen for each of the initial configuration steps. Click "COMMIT" to save the configuration and go to the next screen. Arrows beneath the COMMIT button can be used to revisit previous steps, and change the configuration if desired.

CLI

Alternatively, use the CLI to step through the initial configuration sections. Each step begins by printing its help, which can be reprinted by typing `help`. Use the `done` command to complete each step.

Performing Initial Configuration with the CLI

Login using the password you provided during Installation:

```
caji console login: root
Password:
Last login: Sun Oct 19 02:55:31 on console

To setup your system, you will be taken through a series of steps; as the setup
process advances to each step, the help message for that step will be
displayed.

Press any key to begin initial configuration ...
```

Configure networking. In this example, the existing settings are checked (which were from DHCP), and accepted by typing `done`. To customize them at this point, enter each context (datalinks, devices and interfaces) and type `help` to see available actions for that context. See the Network page for additional documentation or refer to the System Administration Guide at http://wikis.sun.com/display/fishworks. (`http://wikis.sun.com/display/fishworks.`)

```
aksh: starting configuration with "net" ...

Configure Networking. Configure the appliance network interfaces. The first
network interface has been configured for you, using the settings you provided
at the serial console.

Subcommands that are valid in this context:

   datalinks            => Manage datalinks

   devices              => Manage devices

   interfaces           => Manage interfaces
```

```
   help [topic]         => Get context-sensitive help. If [topic] is specified,
                           it must be one of "builtins", "commands", "general",
                           "help" or "script".

   show                 => Show information pertinent to the current context

   abort                => Abort this task (potentially resulting in a
                           misconfigured system)

   done                 => Finish operating on "net"

caji:maintenance system setup net> devices show
Devices:

     DEVICE UP       MAC                     SPEED
       nge0 true     0:14:4f:8d:59:aa        1000 Mbit/s
       nge1 false    0:14:4f:8d:59:ab        0 Mbit/s
       nge2 false    0:14:4f:8d:59:ac        0 Mbit/s
       nge3 false    0:14:4f:8d:59:ad        0 Mbit/s

caji:maintenance system setup net> datalinks show
Datalinks:

   DATALINK CLASS          LINKS       LABEL
       nge0 device         nge0        Untitled Datalink

caji:maintenance system setup net> interfaces show
Interfaces:

  INTERFACE STATE  CLASS LINKS       ADDRS                LABEL
       nge0 up     ip    nge0        192.168.2.80/22      Untitled Interface

caji:maintenance system setup net> done
```

Configure DNS. See the DNS page for additional documentation or refer to the System Administration Guide at http://wikis.sun.com/display/fishworks. (http://wikis.sun.com/display/fishworks.)

```
Configure DNS. Configure the Domain Name Service.

Subcommands that are valid in this context:

   help [topic]         => Get context-sensitive help. If [topic] is specified,
                           it must be one of "builtins", "commands", "general",
                           "help", "script" or "properties".

   show                 => Show information pertinent to the current context
```

```
   commit               => Commit current state, including any changes

   abort                => Abort this task (potentially resulting in a
                           misconfigured system)

   done                 => Finish operating on "dns"

   get [prop]           => Get value for property [prop]. ("help properties"
                           for valid properties.) If [prop] is not specified,
                           returns values for all properties.

   set [prop]           => Set property [prop] to [value]. ("help properties"
                           for valid properties.) For properties taking list
                           values, [value] should be a comma-separated list of
                           values.

caji:maintenance system setup dns> show
Properties:
                      <status> = online
                        domain = sun.com
                       servers = 192.168.1.4

caji:maintenance system setup dns> set domain=sf.fishworks.com
                        domain = sf.fishworks.com (uncommitted)
caji:maintenance system setup dns> set servers=192.168.1.5
                       servers = 192.168.1.5 (uncommitted)
caji:maintenance system setup dns> commit
caji:maintenance system setup dns> done
aksh: done with "dns", advancing configuration to "ntp" ...
```

Configure NTP - how the appliance synchronizes its time. See the NTP page for additional documentation or refer to the System Administration Guide at http://wikis.sun.com/display/fishworks. (http://wikis.sun.com/display/fishworks.)

```
Configure Time. Configure the Network Time Protocol.

Subcommands that are valid in this context:

    help [topic]         => Get context-sensitive help. If [topic] is specified,
                            it must be one of "builtins", "commands", "general",
                            "help", "script" or "properties".

   show                 => Show information pertinent to the current context

   commit               => Commit current state, including any changes

   abort                => Abort this task (potentially resulting in a
```

```
                           misconfigured system)

   done                => Finish operating on "ntp"

   enable              => Enable the ntp service

   disable             => Disable the ntp service

   get [prop]          => Get value for property [prop]. ("help properties"
                          for valid properties.) If [prop] is not specified,
                           returns values for all properties.

   set [prop]          => Set property [prop] to [value]. ("help properties"
                          for valid properties.) For properties taking list
                          values, [value] should be a comma-separated list of
                          values.

caji:maintenance system setup ntp> set servers=0.pool.ntp.org
                      servers = 0.pool.ntp.org (uncommitted)
caji:maintenance system setup ntp> commit
caji:maintenance system setup ntp> done
aksh: done with "ntp", advancing configuration to "directory" ...
```

Configure NIS, LDAP and Active Directory. For additional documentation, see: NIS, LDAP and Active Directory or refer to the System Administration Guide at http://wikis.sun.com/display/fishworks. (`http://wikis.sun.com/display/fishworks.`)

```
Configure Name Services. Configure directory services for users and groups. You
can configure and enable each directory service independently, and you can
configure more than one directory service.

Subcommands that are valid in this context:

   nis                 => Configure NIS

   ldap                => Configure LDAP

   ad                  => Configure Active Directory

   help [topic]        => Get context-sensitive help. If [topic] is specified,
                          it must be one of "builtins", "commands", "general",
                          "help" or "script".

   show                => Show information pertinent to the current context

   abort               => Abort this task (potentially resulting in a
                          misconfigured system)
```

```
   done                => Finish operating on "directory"

caji:maintenance system setup directory> nis
caji:maintenance system setup directory nis> show
Properties:
                     <status> = online
                       domain = sun.com
                    broadcast = true
                    ypservers =

caji:maintenance system setup directory nis> set domain=fishworks
                       domain = fishworks (uncommitted)
caji:maintenance system setup directory nis> commit
caji:maintenance system setup directory nis> done
caji:maintenance system setup directory> done
aksh: done with "directory", advancing configuration to "support" ...
```

Configure the storage pool. See the Storage section for additional documentation.

```
Configure Storage.

Subcommands that are valid in this context:

    help [topic]         => Get context-sensitive help. If [topic] is specified,
                            it must be one of "builtins", "commands", "general",
                            "help", "script" or "properties".

    show                 => Show information pertinent to the current context

    commit               => Commit current state, including any changes

    done                 => Finish operating on "storage"

    config <pool>        => Configure the storage pool

    unconfig             => Unconfigure the storage pool

    add                  => Add additional storage to the storage pool

    import               => Search for existing or destroyed pools to import

    scrub <start|stop>   => Start or stop a scrub

    get [prop]           => Get value for property [prop]. ("help properties"
                            for valid properties.) If [prop] is not specified,
                            returns values for all properties.

    set pool=[pool]      => Change current pool
```

```
caji:maintenance system setup storage> show
Properties:
                          pool = pool-0
                        status = online
                       profile = mirror
                   log_profile = -
                 cache_profile = -
caji:maintenance system setup storage> done
aksh: done with "storage", advancing configuration to "support" ...
```

Configure Remote Support. Refer to (Phone Home) for additional documentation.

```
Remote Support. Register your appliance and configure remote monitoring.

Subcommands that are valid in this context:

   tags                 => Configure service tags

   scrk                 => Configure phone home

   help [topic]         => Get context-sensitive help. If [topic] is specified,
                           it must be one of "builtins", "commands", "general",
                           "help" or "script".

   show                 => Show information pertinent to the current context

   abort                => Abort this task (potentially resulting in a
                           misconfigured system)

   done                 => Finish operating on "support"

 caji:maintenance system setup support> done
 aksh: initial configuration complete!
```

Glossary

Active Directory	Microsoft Active Directory server
Alerts	Configurable log, email or SNMP trap events
Analytics	appliance feature for graphing real-time and historic performance statistics
ARC	Adaptive Replacement Cache
BUI	Browser User Interface
CLI	Command Line Interface
Cluster	Multiple heads connected to shared storage
Dashboard	appliance summary display of system health and activity
Dataset	the in-memory and on-disk data for a statistic from Analytics
DNS	Domain Name Service
DTrace	a comprehensive dynamic tracing framework for troubleshooting kernel and application problems on production systems in real-time
FTP	File Transfer Protocol
HTTP	HyperText Transfer Protocol
Hybrid Storage Pool	combines disk, flash, and DRAM into a single coherent and seamless data store.
Icons	icons visible in the BUI
iSCSI	Internet Small Computer System Interface
Kiosk	a restricted BUI mode where a user may only view one specific screen
L2ARC	Level 2 Adaptive Replacement Cache
LDAP	Lightweight Directory Access Protocol
Logzilla	write IOPS accelerator
Masthead	top section of BUI screen

Modal Dialog	a new screen element for a specific function
NFS	Network File System
NIS	Network Information Service
Project	a collection of shares
Readzilla	read-optimized flash SSD for the L2ARC
Remote Replication	replicating shares to another appliance
Schema	configurable properties for shares
Scripting	automating CLI tasks
Service	appliance service software
Share	ZFS filesystem shared using data protocols
Snapshot	an image of a share
SSH	Secure Shell
Statistic	a metric visible from Analytics
Title Bar	local navigation and function section of BUI screen
WebDAV	Web based Distributed Authoring and Versioning
ZFS	on-disk data storage subsystem

Index

C

Controller
- Installing Mounting Brackets on the Chassis, 15-18
- Installing the Cable Management Assembly (CMA), 23-28
- Installing the Chassis into the Rack Slide Rails, 18-23

P

Power
- Completing Configuration, 65
- Powering On the Appliance, 64-65

S

Shelf, Installing the Disk Shelf into the Rack Slide Rails, 30-37